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IN an inaugural address delivered at the opening of the Rose Polytechnic Institute of Terre Haute, Ind., in March last, President CHARLES O. THOMPSON, formerly of the Worcester Free Institute, outlined the scope and defined the aims of the school to the development of which he is now lending his best efforts. We notice, as a commendable and significant departure from the usual course in civil engineering, that the young men who propose to be civil engineers will spend a part of their time in the machine-shop, that practice time to be concentrated in the first of the four years' course. Mr. THOMPSON'S address will be read with much interest by all those who follow developments in the great and promising field of technical education.

MR. JOHN R. MCCUNE, the umpire chosen by the Railroad Coal Trade Tribunal, has decided the question pending between the railroad coal operators and their men, whether 3 or 3½ cents were to be paid per bushel of 76 pounds for mining for all coal running over a one and a half inch screen. He has fixed the price at 3¼ cents, thus offering a fair compromise, which probably would not have been reached except after a protracted struggle. His reasons are certainly convincing. While acknowledging that there is little profit in mining in the present overcrowded state notably of the lake markets, he urges that some saving might be made by operators in the expenditures for dead-work, royalty, and car service, thus enabling them to meet the men half-way. The latter, on the other hand, are told that they are mistaken when they assert that the cost of living now is as great as when the price of mining was four cents. Mr. MCCUNE'S statement is forcible ; it is that of a clear-headed, impartial business man, who has looked the issue squarely in the face, and advises both parties, for their common good, to yield to the hard logic of facts. It is a question which Pittsburg operators will not unnaturally ask themselves, whether they must not be content to give up a large share of the lake trade for good, unless they can establish by undeniable evidence, not alone that their coal is better than that of their younger rivals, but place it before their customers in dollars and cents.

FROM England comes news that ought to be gratifying to those of our Western copper producers who sell argentiferous copper ores and mattes in the English market. We understand that recent contracts made there show better prices, equivalent to about 13 cents for the copper in the ore or matte. This, we understand, is due to the fact that a little "ring," as we should call it in this country, among the three smelting-works which controlled the working of this class of material, is threatened with competition. A firm near Liverpool has recently commenced working, and it is stated that the building of another large works is contemplated.

As for those producers who ship ordinary refined copper or black copper, the course of the London market during the past six months has been fairly encouraging. It is generally understood in England that one firm has been persistently bulling the market, and from a statistical point of view the market is in a fair condition. Messrs. JAMES & SHAKSPEARE, of London, furnish the following figures for the first six months of the year :

		January 1 to June 30.		
		1883.	1882.	1881.
Imports	Chili	20,583	20,388	17,337
	Other foreign	21,381	16,580	18,250
Tons		41,963	36,968	35,587
Deliveries	Chili	19,799	21,606	21,323
	Other foreign	21,138	16,779	14,868
Tons		40,937	38,385	36,191

According to the same authority, the visible supply on the 30th of June was 48,197 tons at the close of last month, against 46,587 tons on the 31st of December, 1882, and 47,401 tons on the 30th of June, 1882. The Board of Trade returns are not yet at hand to show how the arrivals were distributed. So far, there are no features in the situation in London or here to warrant any uneasiness, while a revival of business activity may easily be attended by a higher range of values on both sides of the Atlantic.

"WHAT IS A KNOWN LODE?"

Section 2333 of the U. S. Revised Statutes provides that

"Where a vein or lode, such as is described in section 2320 (that is, a vein or lode of quartz or other rock in place, bearing gold, silver, cinnabar, lead, tin, copper, or other valuable deposits), is known to exist within the boundaries of a placer-claim, an application for a patent for such placer-claim which does not include an application for the vein or lode-claim shall be construed as a conclusive declaration that the claimant of the placer-claim has no right of possession of the vein or lode-claim ; but where the existence of a vein or lode in a placer-claim is not known, a patent for the placer-claim shall convey all valuable mineral and other deposits within the boundaries thereof."

Under this provision, the Iron Silver Mining Company at Leadville, Colo., brought suit against certain parties working lode-claims upon the (patented) Wells & Moyer placer-claim belonging to that company. A clause in the placer patent excepts from the grant thereof all lodes known to exist within the claim at the date of the application. It seems to have been admitted that no lode had in fact been *located* prior to that date ; but the defendants contended that it was generally known that a lode or vein of rock in place existed within the placer-claim before the application for a patent ; that shafts and other developments before made in lode-claims adjoining the placer established the fact that a vein or lode extended underneath the placer-claim. From this, they argued that it was a "known lode" within section 2333, was excepted from the grant in the patent, and they had the legal right to go upon the surface of the placer, after patented, and sink shafts and locate and hold portions of this vein.

In the United States Court at Denver, Judge MCCRARY held, upon these pleadings (in the case of the Iron Silver Mining Company *vs.* Sullivan *et al.*), that the term "known lode or vein" within section 2333, which was reserved out of the placer patent grant, meant a known lode or vein mining claim, which had been duly located or recorded and owned by some third party before the application was made for the placer patent ; and as it appeared by the defendants' answers that they did not locate or discover their lode-claims till after the placer patent was applied for or had issued, their rights were not reserved or excepted in the placer patent, and they were trespassers on the patented ground of the plaintiff company.

This decision applies to several cases. It is reported that one of them,

as a test case, will be carried up to the Supreme Court. The above statement of the point involved is taken from an intelligent and apparently accurate summary in a Denver journal. Assuming it to be correct, we do not see how the Supreme Court can refuse to confirm this decision. There may be circumstances that would justify the conclusion that a lode is known to exist before it has been duly located. We can imagine, for instance, that an explorer might find and fully expose a lode, and that, by a sharp race or a clever trick, some one might cover it on the record-book with a placer-claim, just before he got it recorded. But no such circumstances exist in this case. The "lode" here is the "contact" or ore-bearing zone of Leadville; and it was simply inferred or presumed, not known, to exist under the placer-claim. As a matter of fact, in numerous instances, placers do cover the outcrops of the lodes that formed them. "Deposits of *débris* in place" is the name given to such placers, and a striking example is furnished by the great gold mine known as El Callao, in Venezuela, of which a brief account, from an excellent authority, is given in another part of this issue of the JOURNAL. But something more than this possibility or even probability should be required to constitute a "known lode."

The case above mentioned is important and noteworthy in several particulars. It is one of the few victories won by the Iron Silver Mining Company out of much litigation. The lode-locations, made with much patient care and at great expense, by Mr. WILLIAM A. STEVENS, and afterward acquired by this company, have been repeatedly curtailed of the privileges which the law was intended to confer, by the hostile verdicts of Colorado juries, who seemed determined that, law or no law, there should be no "going beyond side-lines," if they could prevent it. Now the placer-claims came into court, and in this case with better luck. This decision gives to the company an area of 160 acres in California Gulch and on Printer Boy and Iron hills, under a large part of which the "carbonate contact" is supposed to extend. Within this area, no lode-claims are recognized, if not "known" before the application for the placer patent. A large number of later lode-locations are thus ruled out. Among them are said (we do not know with what accuracy) to be the Brooklyn, Eighty-One, Sligo, General Sherman, Rebel, Minnie, Minnehaha, Gray Eagle, Gardiner, Goodell, and Arctic.

This decision, if sustained, opens a curious suggestion to miners. Since the law does not require that placer-claims shall contain placers, but declares that they may include "all forms of deposit excepting veins of quartz or other rock in place;" and since it provides that a placer-claim not containing "known" lodes shall cover "all valuable mineral and other deposits within the boundaries thereof," it is only necessary for a miner who has discovered "float" in a new locality to avoid looking for any lode, and to locate a placer-claim and make application for patent at once, in order to obtain 160 acres of complete and indefeasible mining rights. The cost per acre will be but $2.50, against $5 for a lode-claim; and the limitation of the side-lines may well be submitted to, in view of the large area. It appears, therefore, that for any one who likes that sort of title, the "square location" is already given by law, even on quartz-claims, and in dimensions exceeding all that has been heretofore proposed. We shall not be surprised to see shrewd operators taking advantage of this fact; and the result will be a good deal of fighting. *

THE TRANSMISSION OF POWER BY ELECTRICITY IN MINES.

The exigencies of special circumstances in the use of power in mines are often so peculiar that necessity forces engineers to adopt methods which above ground might be considered unwise. Work in inaccessible localities, danger of fire, inefficiency of ventilation, often make the carriage of steam through long lines of pipe practically impossible, and therefore hydraulic power, and more frequently still, compressed air, have found more frequent applications than above ground. A valuable addition to the number of methods of transmitting power over long distances has, of course, been hailed by mining engineers with much satisfaction, and they were among the first to turn transmission by electricity to account. Some time since, we submitted data gathered by work in a number of French mines, and through the publication of results by B. R. FÖRSTER, manager of the Royal Saxon collieries, we are in a position to add some details as to the experience gathered there.

Herr FÖRSTER has applied the electric transmission of power to two widely different cases. In the one, it was necessary to secure ventilation for the headings in a colliery at Zankeroda. The plant consists of a Dolguruki rotary engine, running at a speed of 800 revolutions, directly coupled to a Siemens & Halske dynamo machine placed at a distance of 367·5 feet from the shaft. The conductor, a copper rod 0·275 inch in diameter, is carried down the shaft to a depth of 856·3 feet, and from there to the fan, 1335·4 feet, a total distance of 2559·2 feet. The second machine, of the same type, mounted in the mine, is connected with the fan by belting, the fan being of the well-known Schiele type, with a 3·2-foot wheel, capable, according to the statements of the builders, of furnishing, at a speed of 500 revolutions, 6363 cubic feet of air at a pressure of 0 79 inch, and at an expenditure of power of 1¾ horse-power. A series of tests were conducted above ground, with the whole plant complete, but with a length of conductor of only 160 feet. It was found that the engine delivered to the dynamo-electric machine producing the current 2·56 horse-power, of which 1·4 horse-power was converted into work in the receiving dynamo-electric machine, thus showing an efficiency, with a circuit of 160 feet, of 54·3 per cent. The dynamo was then running at a speed of 481 revolutions, which was reduced to 448 revolutions when the plant was in full operation, so that the efficiency of the transmission was reduced by 3·9 per cent in addition, thus carrying it down to very nearly 50 per cent. The fan, when the driving dynamo was running at 800 revolutions, was making 361 revolutions per minute, delivering 7000 cubic feet into the air. The cost of the entire plant was low, and it is reported to have worked efficiently for many months since its construction.

The second case of a successful application of the transmission of power by electricity is quoted by Herr FÖRSTER, who arranged the electric railroad in one of the main cross-cuts of the Oppel colliery at Zankeroda. The cross-cut is 2362 feet long, and is the outlet for the coal mined in the vein, the quantity delivered to it being 600 mine cars per day of 16 hours, each car containing 1047 pounds of coal, and weighing loaded 1594 pounds. We can not enter into details of the construction of the plant. It resembles in many points the design generally adopted by SIEMENS. In practice, a train of fifteen cars is moved at a speed of from 7·4 to 9·8 feet a second, the steam-engine at the mouth of the shaft making from 225 to 250 revolutions during the run, lasting from 3½ to 4½ minutes, through the 2034 feet of cross-cut. When the steam-engine was doing this amount of work, it delivered, according to brake trials made, 11·2 horse-power. The locomotive was at the same time developing 4·18 horse-power, or, assuming the friction of the gearing of the locomotive to have occasioned a loss of 25 per cent, the power actually transmitted by the electric current to the locomotive was 5·22 horse-power, or 46·6 per cent. The consumption of steam, with a pressure of 65 pounds, is estimated at 45·6 cubic feet per round trip of 15 cars. Herr FÖRSTER gives a statement of cost in which he shows that, making an allowance of 15 per cent of the cost of plant annually for wear and tear and sinking fund, it costs per car of coal hauled 3·01 pfennige with the electric road, 3·71 pfennige with horses, and 6·2 with men, when hauling 660 cars per day. When the capacity is increased to 800 cars per day, the cost for the electric road is reduced to 2·70 pfennige, while the others are not sensibly affected.

These two examples, we believe, furnish ample proof of the fact that there are probably many cases in which the transmission of power by electricity would pay well, notwithstanding the fact that the loss may be roughly placed at 50 per cent for moderate distances. This is particularly so where fuel is cheap, or where high heads of water are available, as in many of our mining districts, so that turbines running at a high speed can be used to drive the dynamo machines. There is only one point in connection with the electric railroad which needs attention. It seems difficult and dangerous to stop the trains suddenly, so that the engineer has not that absolute control over the locomotive which is desirable, even in underground roads.

CORRESPONDENCE.

[Communications will be noticed only when accompanied with the full name and address of the writer. Unless specially desired, only initials will be printed. We invite criticism and comment by the readers of the ENGINEERING AND MINING JOURNAL. Replies not intended for publication should be addressed to the Editor of the ENGINEERING AND MINING JOURNAL in blank, stamped, and sealed envelopes. We do not hold ourselves responsible for the opinions of our correspondents.]

Working Gold Ores in Georgia.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: For one and a half years, I have been experimenting with the "Dr. Charles process" for working sulphuret ores in these mines, with the results given below. Although the mine shows a great abundance of $10 ore, it is of so refractory a character that, for the last twenty-five years, all attempts to work it have resulted in failures.

The Charles process, as originally planned by him, included heavy and costly machinery, requiring great power to drive it. The result was all that the inventor promised, and of course entirely satisfactory; but the means of reaching it were entirely too slow and quite unsatisfactory. By carefully watching the process from beginning to end, and throwing out first one and then another part of the heavy machinery, I found it all to be useless, and worse than useless, except the concentrator.

The secret was all in his method of preparing the mercury. To make sure of this, other prepared mercury was tried, then chemically pure mercury, and the greatest care taken to get the most favorable flow of water over the plates, and the best adjustment of them. Our stamps are 750 pounds each, and I find by careful experiment that a 7-inch drop, 50 drops per minute, gives the best result. Our ore is much harder than the Lumpkin County ores, requiring heavier stamps. The exact amount of ore run through ten stamps in twenty-four hours I can not tell; but the amount of gold made will average fourteen dollars to the stamp every twenty-four hours. Every thing taken from the mine is run through the mill and counted as ore. The tests were in three runs of ninety-six hours each; the ore taken equally, as nearly as possible, from the different parts of the mine; and the three runs averaged, each in the clean-up, 14,000 grains gold 965 fine. The runs with chemically pure mercury and that prepared in the ordinary way, from exactly the same ore, gave less than one third.

The process is not patented, and the extra cost of using it is about five

cents per ton. The total cost of milling and separating our ore is about fifty cents per ton, or about double what it costs in Lumpkin County.

There are very extensive mining properties in this vicinity, developed and undeveloped, that will pay from $3.50 to $10 per ton in the mill worked by this process, some of them showing immense amounts of low-grade ($3.50) ore above water-level, with water-power to run 300 heavy stamps. Such a mill would earn about $30,000 a month, and cost about $150,000 to build, with all modern improvements.

A start has been made to build a 160-stamp mill on one of these mines, to run by water-power. A wire-rope tramway will carry the ore from the main working-shaft to the mill, a distance of 1200 feet, with a fall of 12 degrees. A drain and cross-cut tunnel, about 1500 feet in length, cuts one vein 15 feet thick, two 8 feet thick each, and some smaller ones, 150 feet below the surface. The values of these ores are not given from assays, but from actual working in our common stamp-mills, in 100-ton lots, and will be repeated to satisfy any responsible parties who may wish to make such a test of Georgia ores. To such parties, this company's mines and mills are at any and all times open for inspection. No charge will be made for working 100 or more tons of ore from any of the mines, and the very closest scrutiny is invited. This company has no interest in other mines in the South, and no property for sale; but does this to satisfy those people who are afraid of mining property here, and yet are desirous of investing money in this line. A. H. MOORE.

OPHIR, CHEROKEE CO., GA., May 24.

A Reply to Mr. Arents.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: In answer to the reply of Mr. Arents, in your issue of July 7th, I wish to say only a few words in regard to the experiment at the Northern Belle mill. It is hardly possible to make a reliable test by roasting one ton of the ore in a Stetefeldt furnace of large capacity. Mr. Belding does not state how he obtained "loss in roasting, 5 per cent of weight and 9 per cent of value." Nor is it entirely clear to me what he means. In fact, to determine a loss of silver in roasting by the ordinary method is impossible in this case. The roasted ore is spread over such a large area that it is not practicable to collect it all. And if this were done, the product would not represent the original ore. Large quantities of roasted ore cling to the walls of the furnace and dust-chamber, and drop down constantly. Besides this, I wish to say that Mount Cory ore, resembling in its mineralogical character very much the Ontario ore, needs a different treatment from Northern Belle ore, to obtain high chlorinations. The Northern Belle ore is not "banked up," but cooled shortly after discharging. If a larger quantity of Mount Cory ore, say 10 tons, as Mr. Arents himself suggested, had been put through the furnace, and kept on the cooling-floor for twelve hours, as is done at the Ontario mill, the chlorination of the silver would have increased materially, and the loss in tailings would have been, most likely, 5 or 6 per cent, in place of 14 per cent. Mr. Belding himself is fully aware of this in stating that more experience in treating this ore would improve results materially.

NEW YORK, July 10. C. A. STETEFELDT.

Mechanical Roasting-Furnaces.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: In your issue of June 30th, I notice a long communication from Mr. C. A. Stetefeldt, criticising the remarks on "Mechanical Roasting-Furnaces," which appeared in the paper I read before the Institute of Mining Engineers at the Roanoke Meeting. In his anxiety to make known the special merits of the Stetefeldt furnace, he has rather unfairly quoted sentences from my paper, which, standing alone, without the sentences which follow them, give an entirely different meaning to that which is really expressed. The quotation he bases his remarks on is the following: "Like all mechanical roasters, however, this furnace can not be relied on for perfectly uniform results; and until this and other mechanical difficulties have been obviated, I have fallen back on the old-fashioned but always reliable Fortschaufelungs furnace." Here he stops his quotations, evidently because the following sentences, explaining the reasons for the adoption at this particular mine of the reverberatory furnace, are plainly set forth, and would appear, I believe, rational to most mining engineers. This sentence which he omits is: "Here, in the South, where labor is obtainable at 90 cents per day, where wood costs us less than $1 per cord, delivered at the furnace, the advantages to be gained by automatic rabbling, in whatever way obtained, are so slight that they are much more than counterbalanced by the perfect control one has all the time over the charge roasted in the reverberatory furnace. The advantages of the latter in the matter of first cost are, of course, undeniable." As this latter sentence shows, I am by no means advocating a general abandonment of the mechanical roasters for reverberatories, but merely point out the fact that there are still places where the latter can be economically and advantageously adopted. I fully agree with Mr. Stetefeldt in his remarks, that "of all engineers, the members of the American Institute should be progressive and well informed;" but my idea of a progressive and well-informed engineer is one who, by reason of his experience and observation, is able to obtain the best average results with the most economical outlay of capital. It does not follow that, because under certain circumstances one metallurgical appliance proves better than another, it would also prove so under diametrically opposite conditions. Mr. Stetefeldt, in warning all engineers from following such an example as mine, seems to assume that reverberatory furnaces, because they have proved themselves successful for one hundred years, should now, under all circumstances, be abandoned for other furnaces, whether the conditions which called forth the invention of the mechanical furnaces prevail or not. As a fact, Mr. Stetefeldt is probably aware that to-day, except where labor and fuel are exceptionally high, the reverberatory furnace, for roasting ores, is the one most generally in use; and that it has attained the venerable age of over one hundred years, is certain proof of its adaptability to the uses it is put to. Farther on, Mr. Stetefeldt, as a proof of the non-reliability of results from this class of furnace, quotes the fact that, in zinc-blende roasting, "the roasters are fined if they leave too much sulphur in the charge." He forgets to add, though, that as a general rule, these men work by the ton, and naturally endeavor to push the yield of the furnace beyond its natural capacity. In fact, this is one of the advantages of this class of furnace that, while practically giving a continuous process, each individual charge is under the perfect control of the operator. The example quoted by Mr. Stetefeldt of the operations at the Manhattan mill scarcely bears on the subject, as the conditions there are totally different from what they are down South. In regard to the "Brückner" furnace mentioned, Mr. Stetefeldt, as well as every other engineer who has had experience with it, will agree that it does splendid work when in the hands of thoroughly experienced men; but no one, I fancy, would assert that the results are generally better than those obtained in a well-managed reverberatory, and certainly the first cost is very much higher.

Now, in regard to the Stetefeldt furnace itself, probably few engineers besides Mr. Stetefeldt have greater belief in its many advantages, especially for chloridizing roasts, than myself. Its excessive cost, however, very naturally prevents its general adoption except by very wealthy companies. Further, I do not think that so far it has been introduced for roasting sulphides of iron sufficiently to prove all of Mr. Stetefeldt's claims for it. We all know that the combustion of sulphur is a very slow process. It requires not only the presence of a very large surplus of oxygen, but also requires considerable *time*, and as the amount of sulphur in each charge is liable to vary very materially, it stands to reason that the best furnace (all other considerations being equal) is the one where the ore can be subjected at will to a longer or shorter exposure to the oxidizing medium, as may be necessary. In this respect, the rotary furnaces would seem to have considerable advantage over the shaft furnaces. Now, one word more in regard to the relative cost of the two furnaces, on which Mr. Stetefeldt lays so much stress, and it will be apparent that circumstances may occur where, if a mining engineer has any regard to the pockets of his stockholders, it is better for him to adopt, provisionally at least, appliances a hundred years old rather than newer inventions of a more expensive type. The actual cost of one forty-foot reverberatory furnace was, according to the company's books, $760. This was exclusive of the chimney, which was already built some time ago. The cost of roasting, quoted at $1.10, fully includes all incidental expenses and allowances for wear and tear, the actual cost of roasting being 86½ cents per ton. Now, Mr. Stetefeldt, basing his figures on 24 tons per day, puts the cost of roasting at 59½ cents per ton, or, in round figures, one half our present cost, and from this deduces that an annual saving would be effected of $3636 by the use of his furnace. He further admits that these figures, under a less production, would be materially changed Now, as a fact, our present production of concentrates is under ten tons per day, so that, taking him at his own figures, if I had put up one of his furnaces, the cost of roasting would not have differed much from our present cost, and our stockholders would have been out of pocket to the tune of $9740, for no apparently corresponding benefit, except to the Stetefeldt Furnace Company. I can assure Mr. Stetefeldt that the whole matter was very carefully considered before such a retrogressive step in engineering practice was taken, as he calls it, by the erection of an appliance having one hundred years' record of good results.

As soon as Mr. Stetefeldt can get some more progressive engineers having the same conditions applying as with us to put up one of his $10,500 furnaces, and prove to us by a six months' run the claims now set forth by him, I can assure him I shall not prove too old-fogyish to consign our present furnace to an honorable oblivion, and at once erect one of his stately structures in its stead. E. GYBBON SPILSBURY.

NEW YORK, July 11.

EL CALLAO MINE OF VENEZUELA.

Special Correspondence of the Engineering and Mining Journal.

This mine is situated in Venezuelan Guayana, on the drainage of the Essequibo River, about 130 miles from the Orinoco River, and 250 miles from the Atlantic Ocean.

The lode is of sugary white quartz, about 5½ feet in thickness, with a pay-chute of ore from 600 to 700 feet in width; the lode has an average dip of 42 degrees; the greatest depth attained is 490 feet.

The mine is situate in a low valley, and the vein was discovered by placer workings from the surface down some 60 or 80 feet in depth, to a point where the vein became solid. No record was kept of the placer gold thus obtained; probably fully $2,500,000 were taken out from 1856 to 1870, when the lode proper was reached. From 1871 to May 15th, 1883, 144,265 tons of ore have been mined and milled, yielding 533,860 ounces of gold. 916⅔ fine, or an average of 3·7 ounces per ton.

The ore is crushed by American stamps; the gold is saved by amalgamation in the batteries and on short copper plates. The sulphurets, amounting to from one half to one per cent and of high value, have practically never been utilized. With proper concentration-works, the ore would probably have shown a gross yield of fully 4½ standard ounces per ton.

For the first six months of 1883, about 12,000 tons of quartz have been crushed, yielding nearly 61,000 standard ounces of gold, or over 5 ounces per ton.

El Callao is by far the richest free gold quartz mine the writer has ever seen, and is probably unexampled in the history of gold mining.

S.

WASHING GOLD IN PERU.—A correspondent sends *Iron* the following account, describing how the Peruvians did, and perhaps do, successfully operate: "The whole of the Chucamba (Peru), for a number of leagues above and below the Temple of the Sun, is auriferous, and the inhabitants of the province of Huamelies, through which it passes, obtain, by washing the sand and by means of sheepskins, $200,000 or $300,000 worth of gold annually. The wool on the skin is cut out until it is about half an inch in length. The skins are then anchored down, with the wool side up, by means of loose stones placed on them, in and below the various rapids, in which position they are suffered to remain from six to twenty-four hours. They are then carefully raised out of the water, turned wool side downward into a batea (tub) of water, and thoroughly washed; the gold falling from the wool of the skin is finally collected from the bottom of the batea. Sheep were unknown to the Incas, and as they had obtained an immense amount of gold from this Pactolean stream, it is presumed that they used the skins of the llama and those of the vicuña.

OFFICIAL STATEMENTS AND REPORTS.

THE CERALVO MINING AND BENEFICIATING SYNDICATE, CERALVO, MEXICO.

Mr. Richard E. Chism, a mining engineer who is known to have had experience in Mexico, has recently reported on the mines belonging to Mr. F. P. Thompson, of Monterey, in the Ceralvo District, Nuevo Leon, Mexico. Mr. Chism describes the main geological feature of the district as massive limestone, in which most of the ore-deposits outcrop. Mr. Chism notes in detail the developments, the character of the veins, and the extent of the reserves in the Guadalupe, Mina del Agua, Refugio, Colorado, and Valenciana mines. The ores are calcareous and ferruginous mixtures of galena and blende, with considerable quantities of copper in some instances, and varying amounts of silver. Mr. Chism estimates that the Guadalupe has $62,000 profit in sight, the Mina del Agua $51,000, the Refugio $27,000, the Colorado $256,000, and the Valenciana $30,000. We are not in a position to critically examine these figures, which Mr. Chism seems to have compiled with an evident desire to be on the safe side, so far as a calculation of the quantities of ore available is concerned. He has, however, decidedly over-estimated its money value, so far as the lead is concerned, and we believe that he is not under any circumstances justified in looking to the utilization of his zinc-blende with a profit. It is simply preposterous to expect to work zinc-blende in an out-of-the-way place in Mexico for three cents a pound. We would advise those who own the mines to deposit their blende on the dump for the present, and consider its presence in the ore rather as a very serious drawback than as a possible source of revenue.

STEEL versus IRON FOR MACHINERY PURPOSES.

In the course of a discussion before the German Society of Engineers at Aix-la-Chapelle, Herr André gave the following instances of the failure of steel to take the place of iron, notably for heavy machinery:

Two years ago, we replaced the iron shaft of a high-speed steam-engine by a Bessemer steel one, manufactured at works which for such articles stand almost, if not quite, equal to Krupp and Bochum. After two years' work, the shaft broke suddenly when moving very slowly, and without any load attached (the train of rolls was not coupled). We were about to replace it with another Bessemer shaft of mild steel, when the manager of the steel-works himself advised us to return to the old material if there was any risk of the shaft becoming occasionally heated while working; for, he said, strong cooling appliances were then brought at once to bear on the shaft, which produced microscopic cracks on the surface, and these, in a short time, might produce an unexpected breakage. In order to confirm this, he (the speaker) telegraphed to ten wire-works where similar engines were in use, and found that the majority employed and preferred iron. It appears, therefore, that iron shafts are again replacing the steel ones which had superseded them for quick and heavy work, where there is any risk of heating. This was further confirmed by the foreman of engine-works on the Rhine, who stated that in two years they had had five breakages of heavy steel shafts, and had in each case replaced them with iron. In one of these steel shafts, of 15·75 inches diameter, a hole as large as the fist was found, and in it were two small steel balls, which had ground themselves quite round and smooth in the two years. As mild steel is even more inclined to form bubbles than hard, it seems to be, at present, even less adapted for heavy shafts and pieces.

It appeared to be as little adapted for steam-boilers. The same engineer, for example, had informed him that a boiler he had constructed cracked right across the bottom when removed from the workshop to the survey-yard, although great care had been taken in riveting and drilling the holes.

The constructor should remember also that "mild steel" is a very vague term; and it is necessary to ascertain where and by what process it is made. Nothing can be determined by the amount of carbon it contains; for, although one can estimate approximately, according to the carbon contained, the materials produced by a certain process at certain works, it is impossible to compare the productions of different works, especially where different processes are adopted. For example, Thomas steel, containing from 1 to 1·5 of carbon, may be exceedingly soft, while Bessemer steel, containing the same amount, may be so hard that a knob occurring on a thin wire rod can hardly be rolled away.

The differences in Thomas steel itself are very great, and although Mr. André could speak very favorably of it from personal experience, there were many complaints of inequalities. If an engineer, therefore, resolves to have no mild steel, but only ingot iron, he will find the border line between the two so confused that the following definition may be looked upon as a necessary expedient, "No material capable of considerable hardening shall be called iron," and, if narrowly examined, it will be seen that a great deal of the ingot iron specified as "incapable of considerable hardening," is, nevertheless, capable of very considerable hardening under certain circumstances, such as a sudden cooling of a heated shaft. This "inconsiderable hardening" is just sufficient to shrink the surface, produce tension, small cracks, and finally breakages.

Herr Petersen supplemented the remarks of the preceding speaker, stating that it is well known that various difficulties occur in casting thick steel ingots, and it is even more frequent to have a porous casting in mild than in hard steel. If steel ingots have incomplete, hollow, or porous spots, these do not become welded together by further heating and working, but, after being rolled thin, they retain their porosity, as unwelded spots are retained in wrought-iron. As these porous places are generally in the center of the ingot, the round bars, piston-rods, and axles made of it have also usually an internal weakness, which it is difficult to set right in the working, and which may cause breakages in the future. Thus the plunger-rod of a subterranean pumping-engine, on being tested with water up to 20 atmospheres, was shown to be hollow in its whole length, and water burst out of the cleft at the end of the rod. The following accident with the piston-rod of a pumping-engine occurred at a Westphalian coal-pit. The piston-rod in question belonged to a single-acting Cornish beam engine, with a cylinder diameter of 6·56 feet, and a stroke of 13·12 feet. The effective steam pressure was 4·5 atmospheres, the vacuum about 23·6 inches, so that the net effective pressure on the piston was 5·3 atmospheres, amounting altogether to 160 tons. The diameter of the piston-rod was 9·84 inches. The break occurred at the beginning of the descent, so that 11·5 feet of the stroke had yet to be accomplished. Falling from this hight, the piston struck the bottom of the cylinder and smashed with it the valve-boxes and all the principal parts of the engine. The breaking strain of the piston amounted in the full transverse section only to about 2·2 tons per square inch, and in the hollow place to about 9·8 tons per square inch. A lead casting the size of the fist was taken out of this hole. These examples are not meant to detract from the valuable qualities of cast steel, but merely to point out those weaknesses in it which must be guarded against in practice.

ECONOMY BY SUBDIVISION IN INSTALLATION AND OPERATION OF POWER AND MACHINERY UNDER VARYING DEMANDS.

By Julius L. Hornig, Jersey City, N. J.

The question of economy in the construction of steam-engines or motors has been discussed with great ability and science, so that the importance of the subject is generally appreciated and a selection is made from the most approved constructions. The economy by suitable adaptation and installation is a question which requires the same attention.

This article is intended to treat, in general, of the propriety of subdivision in installation where varying service is required. Such cases arise in central stations for supply of power, water, light, etc., or in manufactories, where a number of tools or machines are consuming power at varying demand. The object of the writer is to lead to further discussion and elaboration.

The generators of steam, for power under varying demand, will show higher economy by suitable subdivision. The fact that the highest economy in steam generation takes place when the most perfect combustion takes place, indicates that the temperature of the fire should be kept nearest to this point. Therefore, a variation in the quantity of steam required demands that a variation in grate surface should take place, or, in other words, that more or fewer boilers should be operated accordingly.

The question of combination of smaller and larger boilers is worthy of investigation; and, also, the subject of loss of heat from boilers while the fire is banked, in comparison with the loss of heat from boilers at low temperature of fuel and losses consequent to that.

Steam-engines, built for certain maximum capacity, will naturally show at full service the highest economy. Their loss by friction, inclusive of connections or transmissions to do work at a fixed speed, will be found essentially the same from minimum of work to their full capacity.

When work varies much, as, for instance, in the supply of light, this investigation proves important.

The attached economy-curves are worked out approximately from several systems of indicator-cards, and furnish the following:

COMPARISON TABLE OF USEFUL PERCENTAGE UP TO FULL CAPACITY.

WORK-DIVISIONS.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
Per cent for large machine	35	55	66	75	80	86	92	95	98	100
Per cent for small machine	55	75	86	95	100					
Per cent difference	20	20	20	20	20					

The small machine, which has only half the capacity of the large one, doing the same work as the large machine, shows a gain of 20 per cent, if used instead of the large machine when the latter is worked only to half of its capacity.

To consider the loss, a few comparisons only may serve here. In assuming a number of the same class and size of machines installed, and referring to the curve of large machine, the percentage of loss will be found

Working 2 machines, $\frac{1}{2}$ capacity, in place of 1 full = 20
" 3 " $\frac{2}{3}$ " " 2 " = 10
" 4 " $\frac{3}{4}$ " " 3 " = 7
" 5 " $\frac{4}{5}$ " " 4 " = 5

The curve shows a loss of

20 per cent for using a machine only $\frac{1}{2}$ capacity.
34 " " " " " $\frac{9}{16}$ "
54 " " " " " $\frac{3}{20}$ "

The combination of working machines of different capacity must be, evidently, advantageous when using the smaller only for work up to its full capacity, then to change the work on to the larger up to its full capacity, laying the smaller up during the intermediate higher range and adding its service only at demand of rate above capacity of larger machine.

This combining of machines to keep their service nearest to their full capacity must secure the highest economy.

The rate of friction in steam-engine and transmission in other installations will not vary much from electric light machinery taken here as sample, and therefore a similar importance must exist.

This question of economy will apply to the installation of a number of pumps driven by a number of engines where the service varies at times. Also to a series of tools or machines operated under varying demand at factories.

The Holly Water-Works Company carries out a combination of several steam-engines operating one main shaft, and makes steam connection to the cylinders so that some or all may be used for high pressure, or some as second expansion cylinders, as demand may require. This should meet the requirement of subdivision in installation for economical service very effectively.

In first installations, frequently the engines are adopted largely in excess of present service required, as a provision for future extensions, whereby losses are caused in the mean time by increased friction, by the necessity of carrying low steam pressure, and by irregularity in motion due to injudicious expansion.

In transportation service, the timely addition of the so-called hill-horse for vehicles and the pusher for railroad trains, at the steeper parts of

the roads, is an established mode of working motors to nearest steady full capacity.

The auxiliary boilers and engines are found in large works for similar assistance.

From boiler tests on best constructed boilers, it is to be assumed that the highest economy is reached by consuming 9½ pounds of anthracite egg coal per hour per square foot of grate, producing 3½ horse-power. This would give the ratio for best subdivision of boilers to suit a subdivision of engines in installation.

THE COPPER PRODUCTION OF THE WORLD.

Messrs. Henry R. Merton & Co., of London, have compiled the following estimate of the production of copper in the world, the figures estimated being marked with an asterisk. The figures, so far as we have been able to check them, give evidence of having been carefully compiled. The difficulties in reaching close figures are very great, because furnace materials and ores are so extensively shipped from one country to the other.

COUNTRIES.	1879.	1880.	1881.	1882.
Argentine Republic	300*	300*	307	800
Australia	9,500	9,700	10,000	8,950
Austria	245	470	455	455*
Bolivia—				
Corocoro	2,000*	2,000*	2,655	3,259
Chili	49,318	42,916	37,989	42,909
Cape of Good Hope—				
Cape Copper Company	4,328	5,038	5,087	5,000
Canada	50*	50*	50	221
England	3,462	3,662	3,875	3,875*
Germany—				
Mansfeld	8,400	9,800	10,999	11,516
Other German	600*	1,000*	1,743	1,743*
Hungary	976	976	976	976*
Italy—				
Libiola	340	580	680	600*
Leghorn	800*	800*	800	800
Japan	1,900*	1,900*	1,900*	2,800*
Mexico	400*	400*	335	401
Newfoundland—				
Betts Cove	1,500*	1,500*	1,718	1,500
Norway—				
Vigsnaes	2,000	2,040	2,350	2,300
Other Norwegian	412	386	290	290*
Peru	600*	600*	615	440
Russia	3,081	3,081*	3,000*	2,000*
Sweden	800	1,074	995	900*
Spain and Portugal—				
Rio Tinto	12,751	14,559	15,693	15,893
Tharsis	11,324*	9,151*	10,203*	9,000*
Mason & Barry	4,692	6,603	8,170*	8,000*
Sevilla	1,360	1,705	1,340	1,885
Portugueza	770	1,000	1,410	1,700
Poderosa	800*	800*	800*	400*
United States	23,350	25,010	30,882	39,300
Venezuela—				
New Quebrada	1,597	1,800	2,823	3,700
Total	147,656	148,901	158,138	171,613

THE COMSTOCK LODE.

The San Francisco *Bulletin* gives the following interesting history of the rise and fall of the Comstock lode mining speculation, which will be found interesting:

The nominal money value of the Comstock lode has undergone many changes in the last twenty years. From 1861 and on for several years, the mines grew in public favor, and values rose rapidly, and with but few radical contractions. From 1868, prices began to fall off under loss of ore-deposits and a diminished bullion yield. This reduction followed the mines until about the close of 1870. At that time, the twenty-five or more leading mines on the lode were rated at a trifle over $4,000,000 in round numbers. Then came the Belcher and Crown Point bonanza, and values again expanded all along the line. This continued for a couple of years, with now and then an interruption. Before the waning influence of an exhausted ore-body in these two mines had come to be seriously felt, the edge of the bonanza in the Consolidated Virginia and California mines was uncovered. This was followed by an unparalleled inflation in values until 1875, when the properties that were thought to be dear five years previously at $4,000,000, were considered (by some at least) undervalued at $275,000,000.

That was the highest valuation ever put upon the Comstock lode. The same mines from that time forward began to decline in value, long before there was any sign of exhaustion of the ore-body that had led to the inflation. Of course, the level of values was much lower when this information got out. The passing of the first dividend by the Consolidated Virginia settled the business with some, and unloading was the order all along. A few held on, under the belief that it was only a dodge of the enemy. The factor of distrust kept the market from going to pieces for some time after the majority had given up all hope of a renewal of dividends. There is occasionally an old stockholder who still believes that both these mines could pay dividends now, if the leading owners would consent to uncover alleged reserves. The several assessments since levied have not changed the opinions of these persons. Their faith is certainly a pleasant diversion, if not too costly. From $4,000,000 to $275,000,000 was a big jump, and from $275,000,000 to about $3,000,000 was an equally big fall. But these are feats which have been accomplished by the Comstock lode inside of twelve years.

We do not remember the lowest valuation for the Comstock lode in the past three or four years. But the valuation of a year ago was quite small. According to a table compiled by us on July 1st, 1882, the twenty-nine leading mines on the Comstock were valued at $3,061,910. These mines are divided into 4,021,560 shares, so that they were selling a year ago for less than an average of 75 cents per share. The leading stock at that time was Union Consolidated, which was selling at $8.62½ per share. Sierra Nevada was then selling at $4.75, Mexican at $4.50, Best & Belcher at $3.25, and Ophir at $2.15. Thus these five mines were selling for a nominal value of $2,336,420, or 76 per cent of the total for the whole twenty-nine. The only two mines selling at $1 per share were the Gould & Curry at $1.25, and the Utah at $1.05. There were eight mines in the list whose stock was rated at only 5 cents per share, and the rating would likely have been still lower but for the indisposition of the Stock Board to split a five-cent piece. There was a great change in these values last month, prices of some of which culminated about the 1st of June. At that time, Hale & Norcross was the leading stock, selling at $8.50, against $8.62½ for Union Consolidated a year ago. Following is a statement of the valuations of twenty-nine Comstock mines on the 1st of June in 1882 and 1883, with the assessments delinquent between the two dates:

	June 1, 1882.	Year's assessments.	June 1, 1883.
Utah	$21,000	$110,000	$61,000
Sierra Nevada	475,000	400,000	675,000
Union Consolidated	862,500	200,000	775,000
Mexican	453,600	352,800	564,000
Ophir	216,720	201,600	389,080
California	54,000	378,000	216,000
Consolidated Virginia	162,000	162,000	432,000
Best & Belcher	327,600	100,800	529,400
Gould & Curry	135,000	162,000	421,200
Savage	33,600	252,000	341,600
Hale & Norcross	33,600	168,000	952,000
Challar	22,400	168,000	453,600
Potosi	44,800	84,000	201,600
Julia Consolidated	5,500	11,000	22,000
Bullion	5,000	100,000	125,000
Exchequer	10,000	.....	45,000
Alpha Consolidated	7,500	.....	75,000
Consolidated Imperial	25,000	25,000	25,000
Confidence	12,400	6,240	87,360
Yellow Jacket	65,000	.....	582,600
Kentuck	6,000	.....	75,000
Crown Point	20,000	.....	185,000
Belcher	26,000	52,000	161,200
Overman	5,760	28,800	69,120
Caledonia	5,000	.....	20,000
Silver Hill	5,400	5,400	10,800
Justice	5,250	52,500	31,500
Alta	10,800	108,000	75,600
Benton Consolidated	5,400	32,400	16,200
Totals	$3,061,910	$3,160,540	$7,587,260

As will be seen, the nominal value of these securities has more than doubled within the past twelve months. But much of this increased value is supposed to represent new money that has been put in during the interval in the form of assessments. The nominal value on the 1st of June, 1882, with the assessments delinquent during the year, compares as follows with the nominal value at the close of that year:

Value June 1st, 1883		$7,587,260
Value June 1st, 1882	$3,061,910	
Assessments delinquent	3,160,540	$6,222,450
Increase for the year		$1,364,810

THE BASIC PROCESS AT THE PEINE WORKS.

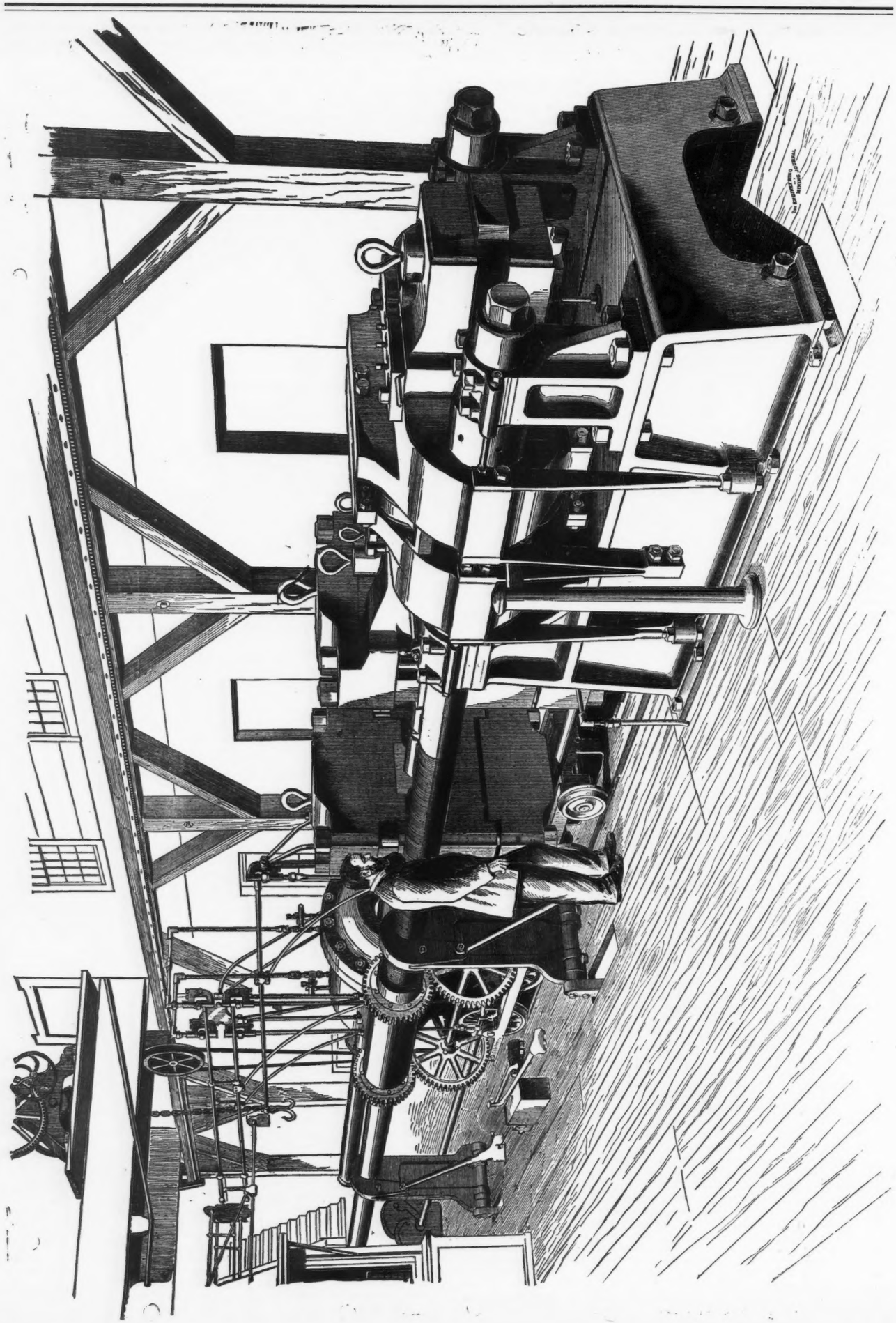
In November, 1882, the Peine Basic Steel-Works were started, and all difficulties met with in the beginning have now, it is said, been overcome. There are very large deposits of phosphoric ores near Peine, Germany, and the pig made from them has from the start been regarded as particularly adapted to the basic process. The dolomite found in the vicinity of Peine contains 1·35 per cent of silica, 0·26 per cent of protoxide of iron, 2·03 per cent of alumina, 30·12 per cent of lime, 19·21 per cent of magnesia, 0·3 per cent of sulphuric acid, and 44·97 per cent of carbonic acid. It is sharply calcined in a cupola, crushed, and mixed with heated tar, the material thus prepared being used to ram the converters, make brick, etc. The walls of the converters stand from 80 to 95 blows, and the bottoms between 16 and 24 blows. The Ilsede pig contains from a trace to 0·1 per cent of silicon, from 2·5 to 3 per cent of manganese from 2·5 to 3·1 per cent of phosphorus, from 2·7 to 3 per cent of carbon, and a maximum of 0·1 per cent of sulphur; and after melting in a cupola, has the following composition: From 0·7 to 1·2 per cent of manganese, from 2·6 to 3·2 per cent of phosphorus, from 2 to 2·5 per cent of carbon, and a maximum of 0·1 per cent of silicon and 0·1 per cent of sulphur. The pig is decarburized in from 8 to 9 minutes, and the after-blow lasts four minutes, the final addition being 12 per cent of pre-heated ferro-manganese carrying from 54 to 60 per cent of manganese. The composition of the steel varies according to whether it is to be used for wire, structural work, etc., as follows:

	1.	2.	3.	4.
Silicon	....	....	....	....
Manganese	0·42	0·47	0·60	0·30
Phosphorus	0·04	0·06	0·05	0·02
Sulphur	0·03	0·06	0·04	0·03
Carbon	0·10	0·14	0·30	0·09

An analysis of the cinder made yielded the following:

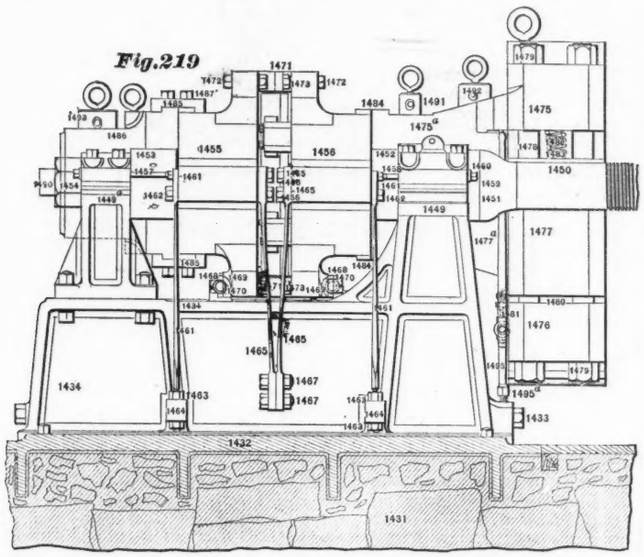
	Per cent.
Silica	2·45
Peroxide of iron	5·74
Protoxide of iron	15·10
Protoxide of manganese	2·75
Alumina	2 85
Lime	46·82
Magnesia	1·14
Phosphoric acid	22 23
Sulphuric acid	0·38
Sulphur	0·54

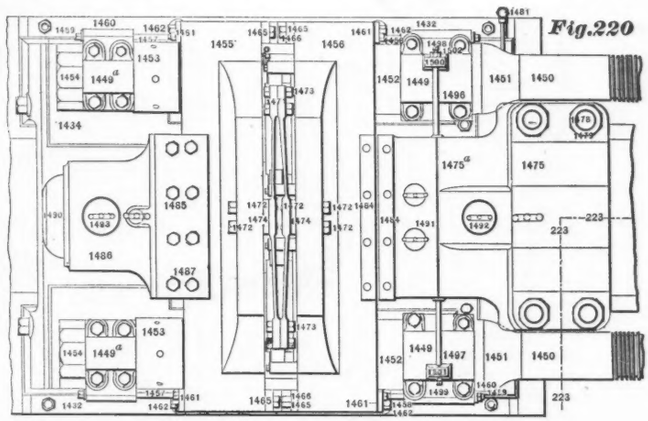
THE WATER-EJECTOR IN MINING.—In the Bleiberg District, Austria, a very interesting application of the ejector has been made in mining, a description of which is given in detail by Herr Ed. Makuc in the *Oesterreichische Zeitschrift*. A Korting ejector has been driven there by hydraulic power, to raise the water from a winze. It now lifts 366 gallons a second from a depth of 92 feet, and uses 435 gallons of power water with a head of 617 feet, thus showing an efficiency of 12 per cent. It is expected, however, that this power will suffice to carry the winze down to 200 feet, so that the efficiency then would be fully 20 per cent. The hydraulic ejector is now working only six hours a day, doing the work of 16 men at hand pumps in twenty-four hours. This system is therefore well worthy of the attention of all those who must sink at isolated points below a tunnel level in which a head of water is available. It would probably prove very useful on the Comstock lode.



THE EMERY TESTING-MACHINE AT WATERTOWN.

Until quite recently, special circumstances have made it impossible to give more than a general description of the great Emery testing-machine at Watertown Arsenal, Mass. The machine, illustrations of which we give this week, was built for the United States Board to Test Iron and Steel by Mr. Albert H. Emery, and before it was accepted by the Board, the following tests were made: A link of hard wrought-iron 5 inches in diameter between the eyes, was slowly strained in tension and broke at





722,800 pounds, and next a horsehair seven one-thousandths of an inch was tested and was found to break at one pound after stretching 30 per cent. These tests may serve to give an idea of the power and the delicacy of the machine, which has no rival the world over.

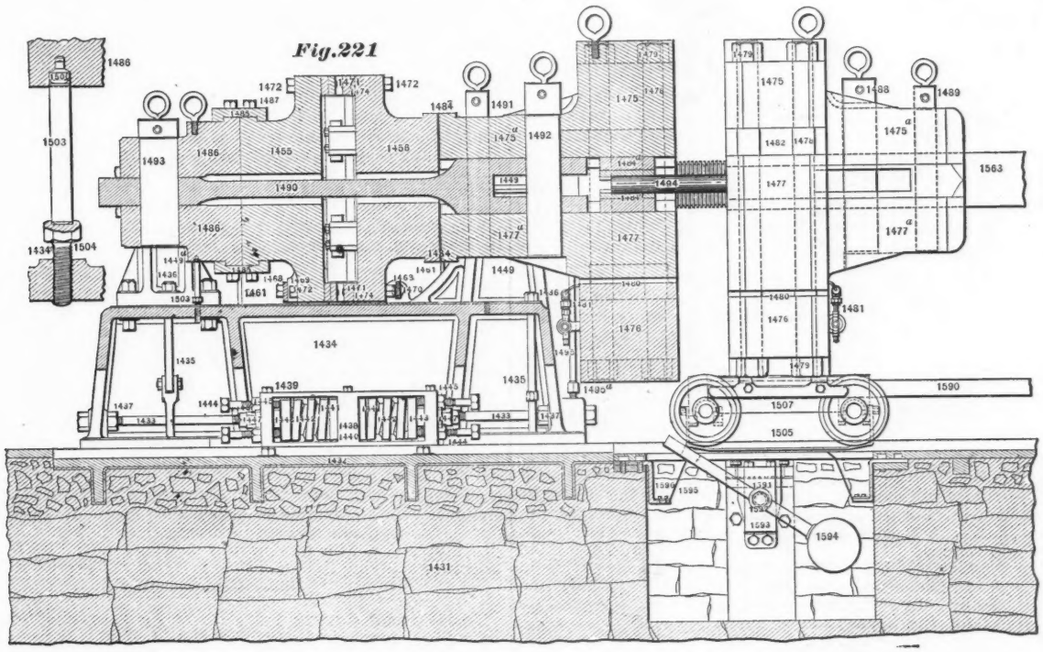
Before proceeding to a detailed description of the machine, a general outline of its construction will be useful. It consists of a hydraulic press, which is adjustable within a certain range as to distance, from the weighing apparatus fixed at one end of the machine, the two being connected by a pair of screws eight inches in diameter and forty-eight feet long, and so arranged that specimens from one inch to thirty feet in length and up to thirty inches in width can be tested. Our general view of the machine gives a good idea of its proportions and arrangement.

Figures 219, 220, and 221, reproduced from the plates attached to the patent, for which we are indebted to the kindness of the editors of the *American Machinist*, give the construction of the most important parts in detail. Fig. 219 shows a side elevation of the scale and of the machine, and Fig. 220 a plan of it.

Fig. 221 shows a longitudinal section of this end of the machine, with the scale-holder, that is, the holder which seizes the specimen and secures it to the scale, and shows in elevation the straining holder, that is, the holder which seizes the specimen and which is drawn backward or pushed forward by the straining press.

From a description prepared by Mr. Emery for the *American Machinist*, and from the patent specification, we take the following points relating to the construction:

1431, Fig. 221, represents a foundation of any suitable construction. To the bed-plate 1432 is secured a movable bed 1434, by means of bolts 1435, secured permanently to the bed or foundation, and provided with the clamp-nuts 1436, by which the bed 1434 is forced to its bed-plate with any necessary friction. The holding-bolts 1435 extend down through clearance-openings in the masonry or concrete bed, and are anchored to metal plates at bottom. The clearance-openings allow free recoil to the beds without bending the



holding-bolts. 1433 represents horizontal stay-rods, which may or may not be connected at their center, and are fixed at their ends by clamp-nuts 1437 to the movable bed 1434. These rods pass longitudinally through a case or bearing 1438, which is permanently attached to the bed-plate 1432 by screw-bolts 1439, and is constructed with a central abutment 1440, for the followers 1441, which receive pressure from the ends of springs 1442. The other ends of these springs bear against followers 1443, which are formed with stems, passing through the ends of the case 1438, and are adjustable therein by means of set-screws 1444, threaded in the ends of the case 1438, and locked in any position to which they may be set by jam-nuts 1445. The rods 1433 pass freely through the followers 1443 and 1441, and are coupled at their

inner ends within the center of the case 1438 by a nut 1446, which is adapted to slide within the abutment 1440, and bears against the followers 1441 on either side. The rods 1433 bear on the extremities of the necks of the collars 1443 by nuts 1447, locked by jam-nuts 1448. It will now appear that any movement of the bed 1434, acting through the clamp-nuts 1437, rods 1433, and followers 1441 1443, will compress both of the springs 1442, so that the resilience of both will be exerted to restore the bed to its central or normal position. To the bed 1434 are fixed standards 1449 1449ª, constituting pillar-blocks for the straining-screws 1450, which are secured to the pillar-blocks by collars 1451 1452 and nuts 1453 1454.

1455 1456 are a pair of coupled beams constituting alternately and interchangeably the bed and platform of the scale, hydraulic supports being interposed between the beams to receive and transmit the load. These beams are adjustable longitudinally on the straining-screws 1450, so that either which is to constitute the bed of the scale for the time being may be brought firmly home against the nuts 1453 or collars 1452, as the case may be, while the other beam is left free to serve as the platform of the scale. This adjustment of the beams is effected by setting-rods 1457 1458, secured separately to the respective beams 1455 1456, and adjustable in the pillar-blocks 1449ª 1449 by nuts 1459, between which nuts and the respective pillar-blocks are interposed metallic washers, and beneath these gum-elastic washers 1460, for the purpose of allowing a slight resilience, to prevent the snapping of the said rods by the concussion incident to the breaking of a specimen. The setting-rods require to have clearance in the pillar-blocks. When one pair is to be tightened to bring the beam to which it is attached against its bearings on the straining-screws, the other pair of setting-rods are first relaxed to free the beam to which they are attached. The weight of the beams is sustained by flexible rods 1461, secured by bolts 1462 to the rear faces of the respective beams, and fixed below by nuts 1463, in lugs 1464, on the movable bed 1434.

1465, Fig. 219, represents spring-plates, which are bolted and secured by the nuts 1466 to the inner faces of the beams, and are strained together at their lower ends and connected by bolts and nuts 1467, so as to exert a strong pressure in forcing the beams together and keeping them firmly on the interposed bearings or pressure-supports of the scale. The plates at the same time serve to hold the faces of the beams parallel by preventing their tipping on the struts 1461, and they serve the further purpose of securing the beams against relative vertical motion. To stay the beams against horizontal motion transversely to the machine, they are held by flexible fixing-plates 1468, Figs. 219, 220, 221, secured at 1469 to the respective beams, and to the pillar-blocks or bed by nuts 1470, by which the beams are adjusted transversely to the machine as required. To firmly secure the beams against relative horizontal motion laterally to the machine, fixing plates or springs 1471, Figs. 220, 221, are employed, fixed at their centers to the respective beams by bolts and nuts 1472, and bolted together at their extremities, as shown at 1473. These springs serve, in conjunction with the springs 1465, to press the beams together on the interposed pressure-supports. The degree of pressure of the springs 1471 is regulated by the interposition of washers 1474, of any thickness required, between the springs and beams, the effect of said washers being to reduce the amount of deflection which is applied to the springs in bringing their extremities together. Similar washers are applied between the springs 1465 and the faces of the beams when required.

The pillar-blocks 1449 1449ª may be made separately from the bed and attached thereto, or they may be constructed permanently with the bed. In practice, it is preferred to construct one pair 1449, as permanent parts of the bed, and for convenience of erection and adjustment to construct the other pair 1449ª separately and bolt them to the bed, as shown. The coupled beams and the specimen-holder at the scale end of the machine may, either or all, be supported from the movable bed, as shown in the present illustration, or upon masonry or other permanent foundation as preferred. The specimen-holders consist each of three beams 1475 1476 1477. The outer beams 1475 and 1476 are secured together by bolts and nuts 1478 1479. The interposed beam 1477 is movable on the connecting-bolts 1478, constituting one jaw of a clamp, of which the beam 1475 constitutes the other jaw. The movable jaw 1477 is forced up to grip the specimen by the action of one or more hydraulic presses, 1480, Fig. 221, suitable dies 1484ª, being interposed between the beams or jaws 1477 1475, with faces formed to suit the specimen to be tested.

1481 represents the pressure-pipe for operating the hydraulic presses 1480. The closing of the jaws 1477 1475 is limited by boxes containing springs by which the jaws are forced apart when released by the hydraulic presses. The two beams 1475 and 1477 of the specimen-holder are formed with projecting cheek-pieces 1475ª 1477ª, for the attachment of the specimen-holder to the load-beam of the scale or to the straining-bar, as the case may be. For the application of strains of compression (for which purpose the beam 1456 constitutes the load-platform, the load-beam specimen-holder is attached to the beam by bolting to flanges 1484, formed on the specimen-holder and beam, clamps 1485, such as are shown in Figs. 219, 220, and 221, fastened to similar flanges on the beam 1455 and the beam-block 1486 by bolts 1487. In the illustration given, the parts are shown in position for the application of a strain of tension. For this purpose, the cheek-pieces 1475ª 1477ª of the load-beam specimen-holder are connected to a beam-link 1490 by pins 1491 1492. The link 1490 extends through central apertures, as shown in the coupled beams 1456 1455, and is connected by a pin 1493 with the beam-block 1486, which latter is fixed to the load-beam 1455 by the clamps 1485 and bolts 1487.

1494 represents a specimen undergoing a strain of tension. In this illustration, the beam 1456 constitutes the bed of the scale, being drawn firmly against the bearing-collars 1452, by the setting-rods 1458, while the setting-rods 1457 are released from strain by backing their nuts 1459, so as to leave the beam 1455 free. Clearance is accordingly seen between the beam 1455 and the bearing-nuts 1453, and also between the specimen-holder and the fixed beam 1456. When a strain of compression is to be applied, the relations are reversed, the specimen-holder being in that case released from the beam 1455, and fixed to the beam 1456 by the clamps 1485 and bolts 1487, the said beam 1456 being released from the bearings 1452, so as to serve as the load-platform, and the beam 1455 being drawn firmly against the bearings 1453 by the action of the setting-rods 1457, so as to serve as the bed of the scale. When strains of compression are to be applied to columns or other specimens without the use of the holders, the beam-block 1486 is reversed in position, being clamped to beam 1456 by plates 1486 and bolts 1487, a suitable platform to receive the thrust of the specimen being attached to said beam-block by pin 1493.

The load-beam specimen-holder is supported on rods 1495, Figs. 219, 221, erected on the movable bed 1434, or on the stationary bed or foundation. The lower ends of these rods are screw-threaded, as shown in Figs. 219 and 221, and they are formed with angular collars 1495ª, for the reception of a wrench for screwing the rods up or down for the vertical adjustment of the holders. By reason of their length, the rods possess sufficient flexibility to permit the slight movement which the specimen-holder receives in transmitting to the load-beam the strain to be weighed. The load-beam specimen-holder 1475, Fig. 220, is stayed against lateral motion by struts 1496 1497 bearing against the cheek-pieces of the said specimen-holder, and fixed by set-screws 1498 1499, screwed into lugs 1500 1501 on pillar-blocks 1449. The set-screws 1498 1499 are formed with conical or convex ends fitting corresponding cavities in the ends of the struts 1496 1497. The set-screw 1498 is first screwed in, to set the specimen-holder in proper position laterally, and is then locked by a nut 1502. The other set-screw 1499 is then screwed in against the end of the strut 1497, to fix the specimen-holder. The beam-block 1486 is supported on a rod 1503, Fig. 221.

The specimen-holder of the straining mechanism is constructed in similar manner to that already described, and is connected to the straining power by its cheek-pieces 1475ª 1477ª and pins 1488 1489. This specimen-holder is preferably mounted on a truck 1507, running on the rails or ways 1505. To determine the pressure given to the specimen by the hydraulic holders, so that the amount of pressure known to be necessary to fix and hold the specimen may be applied without injury thereto, the liquid-pressure pipes connected with the accumulator and employed to operate the holder-pressure are connected with pressure-gauges. The load, after being transmitted through the supports to the beam 1456, is carried directly against the projections on the screws 1450, so that the load which is put upon the screws by the straining press at one end of the specimen is exactly balanced by the load put upon the screws by the scale at the other end, this load being transmitted through the specimen, no part of the strain being carried through the foundations. If now the specimen breaks, the screws being under a load of compression, immediately free themselves of this load, putting the entire scale end of the machine in motion longitudinally in one direction and the press end in the opposite direction, these parts moving from each other until the screws are free from their load of compression, when the inertia of these parts under motion will continue their movement until the screws have received a load of tension nearly equal to the load of compression which was upon them, the difference of loading being that due to the loss of friction by sliding the scale end of the machine on its ways and moving the press on its track. The extension of the screws will now cause the ends of the machine to move together until the screws are free from tension, when inertia of the moving parts will expend itself in compressing the screws and in overcoming the friction mentioned. In order that movable bed 1434 may always come to rest in its proper position, buffer springs 1442, contained in boxes 1438 secured to fixed bed, are provided. See Fig. 221. These motions of extension and compression continue until the work of recoil is used up in the friction of moving the ends as mentioned. These vibrations are so rapid that, when the machine was originally tested in breaking a bar of wrought-iron of 20 inches section, they could be neither seen nor felt, but set gauges applied at each end showed the amount of these movements. They are not only unseen and unfelt, but they are also unheard, the noise of the breaking specimen completely hiding any little noise the machine may make, no jar or rattling whatever being detected in any part of the machine.

The pressure is transmitted through the medium of a number of liquid-pressure reducers. The base or receiving-head of the reducer contains small removable pressure-receivers—one for each of the pressure-pipes coming from the load-beam supports. The small pressure-receivers are each constructed with a stem for the reception of the liquid-pressure pipe, and with a small pressure-column attached to the head of the stem through the medium of a pressure-diaphragm and a lining-plate permanently connected at their edges, clamped to the reducer-base by a sealing-ring, and containing the liquid-pressure chamber between them. The delivering-head of the reducer is removable, being connected by the pressure-diaphragm with a separable head forming part of the pressure-column. The main part of this column is stayed at top by a fixing-plate separate from the pressure-diaphragm. Heavy strains are applied by a double-acting hydraulic press with piston-rods extending in both directions—one for applying strains of tension and compression, and also for transverse strains by the use of other accessory appliances, the other for torsional strains, which are applied through the medium of a chain-frame, double chain, and saddle arranged to impart forcible rotation in either direction to a torsion arm or wheel, which is also formed with a worm for applying lighter strains by means of screw-gearing.

THE DOETSCH COPPER EXTRACTION PROCESS.—So little is known in regard to the technical details of the Doetsch process, which the Rio Tinto has been testing on a large scale for years, that the following points in regard to it may be of interest. The raw ore, broken to a uniform size of about 0·4 inch, is piled up in heaps from 10 to 13 feet high, channels being left along the bottom, and vertical draught-holes being provided for. Then about two per cent of salt is scattered over the top of the pile, which is about 45 feet wide. A basin, 30 feet square, is then formed on the top of the pile, and the solution obtained after precipitation of the copper, subsequently saturated with chlorine, is allowed to flow into it. Trickling through this ore, this solution acts upon the copper. It is gathered in gutters, conducted to tanks, and made to flow through long sluices, where the copper is precipitated with metallic iron, the quantity of the latter being less than usual (from 110 to 120 parts per 100 parts of precipitate). The precipitate, which runs from 80 to 85 per cent of copper, is dried on hot iron plates. The solution, after precipitation, is dropped through a coke tower, in which it is met by an ascending current of a mixture of chlorine and hydrochloric acid.

THE LAW AS AFFECTING MINING AND METALLURGICAL INTERESTS.

Relocation.—Secretary H. M. Teller has rendered the following decision in a letter addressed to the Commissioner of the General Land-Office: I have considered the appeal of Mary G. Peck *et al.*, from your decisions of December 19th, 1882, and February 7th, 1883, holding for cancellation mineral entry No. 1882 upon Gold Dirt lode, Central City, Colorado. The original location was made and recorded in 1864, since which time there appear to have been numerous transfers of the property; and it is alleged by applicants that the possessory title by virtue of said location is in them.

The abstract of title in the case fails to verify this allegation. Applicants, however, made a relocation, dated December 22d, 1880, covering the same ground, and using the same name under which the mine was originally located.

Their certificate of relocation sets forth, among other things, that it is make without waiver of any previous rights, and to secure all abandoned, interfering, or overlapping claims.

They, by their counsel, now admit their probable inability to supply all the links necessary to show by abstract that they have title under the original location, and hence they claim under the relocation of December 22d, 1880.

Your decision holds that a relocator must show a complete and unbroken claim of title from the original locator, ending in himself, or prove abandonment of the property by the original locator or his grantee; also, that relocation, using the same name under which the original location was made, coupled with the attempt to furnish abstract of title from the original locator and grantees, shows that applicants claim as purchasers for valuable consideration, and therefore that the relocation confers no new title upon them.

I am unable to concur in these conclusions.

Generally, I see no reason why a locator should be called upon to furnish any facts or data relative to a previous location upon the same ground, or why an inquiry should be instituted relative to antecedent matters, except upon showing of irregularity and of injury to material interests. The law applicable to adverse claims provides how and when such showing may be made in case any rights are liable to be infringed.

In this case, applicants, by their admission of inability to furnish complete abstract of title under the original location, as required by your office, virtually waive all claim based upon said location, and rely solely upon their relocation.

The proceedings pursuant to the relocation appear to have been regular. None of the apparently adverse interests appearing in the abstract of title was asserted pending publication under said relocation, nor has it been since, and no adverse claim can now be filed because of the limitation of law. Sec. 2325 of the Revised Statutes provides that, "If no adverse claim shall have been filed with the register and the receiver of the proper land-office, at the expiration of the sixty days of publication, it shall be assumed that the applicant is entitled to a patent, upon the payment to the proper officer of five dollars per acre, and that no adverse claim exists."

You state that the right of the claimants, asserted by the relocation, has never, to the knowledge of your office, been questioned. All antecedent claims may, therefore, be regarded as having been abandoned, and all rights which may previously have existed as waived. . . . .

Publication is notice to the world of intention, and a challenge to any and all adverse claimants to come forward and assert their rights.

No adverse claim having been filed in this case, all antecedent claims may, as already stated, be regarded as having been abandoned, and the question therefore becomes one solely between the United States and the applicants. . . . . I see no reason why patent should not be granted as applied for under the relocation of December 22d, 1880. If applicants based their title solely on their rights as purchasers, the regulation of your office, to which you refer, might call for consideration; but I find no rule or regulation, and no law, which, on the facts as they appear, would operate to prevent the issuance of patent on the location made by the parties themselves.

Your decision is accordingly reversed. . . . .

Very respectfully, H. M. TELLER, Secretary.

THE PRODUCTION AND UTILIZATION OF GASEOUS FUEL IN THE IRON MANUFACTURE.*

By W. S. Sutherland.

While fitting on a feed-valve to a locomotive, about 1866, it struck me that, if the seams of boilers could be welded instead of riveted, there would be an advantage gained in strength and economy which was worth the working out; and, though still very far from seeing this generally done, yet we have now, through this idea, made some thousands of tons of welded flues, tubes, and parts of boilers by the process which I thought out, and which certainly greatly increases the strength of the joints, and makes the soundness of the welding an absolute certainty. It would be out of place to describe the process referred to further than is necessary to the development of this paper; and therefore I only add that the first question that arose was, how to obtain the requisite heat and apply it economically, and of uniform quality and concentration, upon the parts to be welded. A little consideration pointed out some disadvantages in the smith's hearth, which naturally first occurred to me—namely, that it is practically impossible to insure perfect uniformity of heat by it; that hence welding can only be done by a very skillful smith; that dirt and scoria are liable to get into the welds from the fuel; and that an access of air may get to the metal and burn it, thus destroying the whole of the work. Gas then seemed the legitimate fuel to use; but the gas must not be too expensive, and, to insure uniformity of action, should be supplied with the requisite oxygen or air in proper and definite proportion. But to obtain cheap and suitable gas was not easy, and the only gases that appeared available were coal-gas and Siemens gas. With coal-gas, we were successful, and we welded also with Siemens gas; but experience showed that we wanted a good cheap gas having some special qualities, the first of which was high heating power per unit of volume. I have been unable so far to arrive properly at any other solution of this difficulty than the use of gas made by the action of superheated steam upon carbon, and I found, on arriving at this point, that a method of making such gas had been brought out in America by Mr. Strong. I opened up negotiations with the proprietors of Strong's system, and these resulted in the erection at Birmingham of the first water-gas producer in England, which, so far as I know, works under the method described in the following paragraph: "Part of the fuel is burnt as completely as possible to carbonic acid and water; but the resulting heat is stored up partly in the remainder of the fuel and partly in regenerators, that in the regenerators being made to heat up to a sufficiently high degree a quantity of steam. This superheated steam is passed through the hot fuel, and forms with it carbonic oxide and hydrogen, which go away to be stored up and used." The producer we erected worked well, but it needed a good deal of repair. I was, however, enabled to procure the erection of a second one at Essen, in Germany (now set to work), which does not contain the faults found in the former one, and which, therefore, bids fair so far to answer our expectations. With this producer, we have made per ton of Staffordshire coal 55,000 cubic feet of gas, or about 25 cubic feet per pound of carbon, averaging by volumes approximately—

57	parts	H and hydrocarbon.
35	"	CO.
8	"	Co_2 and N.
100	"	

I have found that, to work well with water-gas (so far as treating iron is concerned), it is necessary to get up to a very high degree (not less than 1200 degrees C., I should say), which, however, can be done without injury to the apparatus if the parts exposed to it be protected by exterior cooling. The quantity of gas above given represents only about from 55 to 60 per cent of the available heat in the fuel; but I believe that by improvements, which may be very simply made, this percentage may be very largely increased, although, since there is a double operation and combustion in making the gas, the loss of heat must evidently be greater than in making producer gas. But this loss is, except when regenerators are used, largely counterbalanced by the higher temperature which can, owing to the absence of nitrogen in the gas, be obtained by its simple combustion, and by its greater heating power per unit of bulk, which enables much smaller mains to be used to convey it, and by the fact that much smaller furnaces may in many cases be employed. A great objection has been made to the poisonous quality of this gas; but I believe that it is no more poisonous than coal-gas, and, from my own experience with producer gas, coal-gas, and water-gas, I am convinced that the hydrocarbons and tarry matters do far more hurt than the carbonic oxide. In fact, it seems to me that the poisonous effects of carbon gases and vapors are somehow proportional to the weight of carbon in the injurious compound; and in that case, the hydrocarbons in coal-gas are quite as deadly, if not more so, as is well shown by the number of accidents that have happened with coal-gas. Compared practically with coal-gas, the heating power of water-gas seems one half; but experience has shown that it may be produced at a cost not exceeding threepence per 1000 feet, after paying for coal, labor, and plant, and that the first cost of plant is not very great; while for simplicity in using it when made, it is far superior to producer gas, and more easily managed.

It will, perhaps, be called to mind by many that numerous attempts have been made to manufacture water-gas in retorts; but an examination and comparison of these proposals with the methods above described show that the intrinsic difference between them lies in the facility which this method allows of raising the steam and fuel to a temperature which would rapidly destroy the retorts, but which is necessary for the attainment of good working results. While working with Siemens gas in 1871 and 1872, I had much trouble with the tar and water which came over with the gas and stopped up the tuyeres, and which it was therefore necessary to condense and separate. Now, it will be evident from what has gone before that, in making Siemens gas, the higher the temperature at the bottom of the producer, the better the gas made, and the less carbonic acid there will be in it. Many people are in the habit of saying that, if coal be made into this gas, there is a loss of sensible heat amounting to about 30 per cent; and they give as a reason the fact that carbon burnt to carbonic oxide really does generate about that quantity of its available heat, which, if the gases be cooled down, would be certainly lost. But they forget the coal-tar and water, which must be distilled off from the fuel, and to do which requires at least 10 per cent of this heat, leaving only 20 per cent to account for. Now, this 20 per cent is very difficult to utilize, and the only satisfactory way that can be practically carried out is to take the heat down to the bottom of the producer again, and make it superheat steam, so as to form some water-gas. This I did at that time by cooling down the hot gas by the air going to the producer, so that at the same time the tar and water were condensed.

But there is a simpler way of doing it. It is well known that increasing the draught of a fire increases its temperature. Then if the draught in the producer be increased, while increasing the heat at the bottom we shall diminish the carbonic acid in the gas, and at the same time enable more steam to be passed into the producer without increasing the carbonic acid. Now, it must be evident that, by the law of conservation of energy, if this heat at the lower part be increased through the quickened draught, it must be at the expense of the heat in the outgoing gas, or else we should have a means of increasing the quantity of heat produced by merely putting a fan on. Therefore, by this simple means alone, the heat of the outgoing gas may be utilized; and practically we find that, while the carbonic acid may be kept down to from 0·2 to 2·5 per cent, the temperature of the outgoing gas often does not reach 300 degrees C., which represents a loss of only about 7·5 per cent of the total available heat of the fuel. There are two ways of accounting for this result. In the first place, it was pointed out by Mr. Lowthian Bell that the descending column of fuel carried down with it about 5 per cent of the heat produced; and, in the second place, the hotter the fuel, the more the air going to supply combustion will be heated by conduction from the glow

* A paper read before the British Iron and Steel Institute.

ing fuel just before coming into actual contact with it. Thus the reactions go on and heat accumulates, but always at the expense of the upper portion of the fuel and of the outgoing gases. But to work at this higher speed, the producer must be perfectly accessible, so that it may be easily cleaned; there must be as little tendency to scaffold as possible; and, above all, it should not be greater in size than would allow of a man easily breaking up the fuel in it if it caked over or broke through; or, if it be large, mechanical stirring should be resorted to. The problem is to keep the fuel like a sponge, but without large holes and cavities. With the temperature thus kept down, and the loss by cooling made a minimum, little water is needed to bring it down to the requisite point for condensing effectively the tar and water. And as the higher the velocity or draught, the less is the plant required to treat any given weight of coal, so the outlay per ton of fuel gasified and purified is reduced.

I knew that tar and ammonia-water were worth something, but it was not until some years after these experiments that I got the opportunity of carrying out practically their utilization. In 1878, a plant was erected at the Shropshire Iron Company's works near Wellington, which, so far as taking the tar and water out of the gas is concerned, worked very well, and I am glad to say it is now about to be remodeled and extended. This plant was followed by another at the gold and silver rolling-works of Mr. Kemp, of Birmingham, who required very pure fuel for his purpose, and who told me that a drop of tar occasionally getting on to the material would be fatal. However, this has been working well and constantly for over two years, and I believe that no organized system of extracting residuals from fuel, except in the making of light gas, has ever been carried out successfully before. Other plants on this system are now erecting, and more still are about to be constructed in different places. One has recently been set to work in the alkali-works of Messrs. William Hunt & Sons, at Wednesbury, who have so far expressed their satisfaction with it. The working is made as simple as possible. The gas taken away from the producer has its pitch first thrown down to prevent the passages choking up, and is then passed through a condenser, which, while cooling the gas effectively, can increase the temperature of the water for cooling so as to adapt it to steam-raising. It is then scrubbed, to extract the ammonia and cyanides, etc., and, if drawn from the producer, passes through an exhauster. At the high speed kept up, much of the tar is carried on in waves along the interior surfaces of the mains, and if this were stopped in the ordinary way, the fuel absorbed in horse-power would be enormous; but, observing these waves, I thought that if the surfaces of part of the mains were developed and made porous, and contained in an outer chamber, in which a lower pressure could be kept up than that in the mains, these waves would ooze through the porous surface, and get out of the way of the current, while the difference of pressure would prevent them getting in the way again. Experience has proved this idea to be correct. We make these surfaces of wire gauze tubes, up through which the gas passes, a sufficient number being purposely set up in an outer chamber, from which some of the gas is passed by to the other side of the blower. This apparatus is of course on the pressure side. The dried and cleaned gas then proceeds to do its work. We find no difficulty in getting 1¼ cwt. of good tar per ton of Staffordshire coal, and the ammonia-water we have got up to 4 degrees Tweddel; but in the new plants the scrubber is better arranged, so that we may reasonably expect more and stronger liquor.

(TO BE CONTINUED.)

FURNACE, MILL, AND FACTORY.

Messrs. Johnson & Wilson, No. 91 Liberty street, this city, have, as agents for Saylor's American Portland Cement, issued a catalogue which contains considerable matter of interest to cement users generally, without special reference to the Saylor cement. Messrs. Johnson & Wilson, we may note, are also the agents of the Iron, Steel, and Mining Society of the Austrian Alps, a federation of a number of Alpine works that make among other specialties high-grade tool steel.

W. Hasenzahl, Cincinnati, has lately shipped one of his diamond drills, with complete outfit for prospecting, to Montana. A letter received from the president of the Quincy Coal Company states that the company has been using a drill bought from Mr. Hasenzahl a few months since, and is perfectly satisfied with the machine and its work.

At Kankakee, Ill., a barb-wire manufacturing company has been organized which proposes to manufacture the wire without a license.

Rifenburg & Co. have made a proposition to the people of San Diego, Cal., to begin, on certain conditions, the erection of buildings suited for iron and steel-works. Ground has been selected between San Diego and National City. About one hundred men will be employed, it is stated.

The Boston *Commercial Bulletin* says: "The Edwards Manufacturing Company, at Augusta, Me., has decided to close up all work of improvement on the company property at once, and also abandon the project of a new factory. The reason assigned is, that the valuation placed upon the property by the assessors is excessive, imposing a burden which similar property in the State does not bear, and placing the Edwards Company at a disadvantage in a close and depressed market for cotton goods.

The business of the Jarvis Furnace Company and the New England agencies of the Korting Injector, Armington & Sims Company, engines, Sheffield grate-bars, and Schutte & Goehring's jet instruments will in the future be conducted by a stock company organized under the State laws of Massachusetts, with a capital of $100,000. This company will do business under the name and style of the Jarvis Engineering Company. It will not only take charge of the old agencies, but will do a general engineering and contracting business in putting in steam plants for all kinds of manufacturing purposes. K. M. Jarvis is president; A. F. Upton, treasurer and general manager.

At the late National Exhibition of Railroad Appliances, Messrs. Shields & Brown, Nos. 78 and 80 Lake street, Chicago, made a very handsome display of steam pipe and boiler coverings, which attracted much attention. They also covered over a thousand feet of pipe in the Exhibition building, thus illustrating the merit and value of their coverings to all interested visitors. This enterprising firm was awarded by the Exhibition the silver medal which was offered for the best boiler and pipe covering. There were five other exhibitors present in the same line. Among their patrons are the Pullman Palace Car Company, the Chicago, Burlington & Quincy Railroad, the Edison Electric Light Company, and many others.

The Merrimack Manufacturing Company, of Lowell, Mass., has recently put in a five-inch Curtis pressure regulator for its steam-pump, which throws a ten-inch stream and supplies fresh water to a battery of boilers of 7500 horse-power.

The Ontario Rolling-Mill Company, Hamilton, is making large quantities of angle fish-plates for the Grand Trunk, Canadian Pacific, and Canada Southern railroads.

The new McKenney Tubular Rail Company, of Chicago, will locate its works at La Grange, Mo.

The Duncansville rolling-mill, near Hollidaysburg, Pa., which suspended work for repairs, is now running on full-time.

The rolling-mill of McKee, Anderson & Co., at Beaver Falls, Pa., has shut down for a month.

Five more blast-furnaces are to be added to the five already in operation in and around Birmingham, Alabama. It is now proposed to open several new coal-beds and build new furnaces as soon as the railroads furnish the transportation facilities.

The main shop of the Cleveland City Forge and Iron Company is 80 feet wide by 800 feet long, and has 15 hammers made by the Cuyahoga Steam Furnace Company. Ten of the hammers have a single furnace and cylinder boiler, and five of them have double furnaces and flue boilers. The works can make shafts up to 40 tons in weight, all finished and ready to go into the boat. The axle works have a capacity of 500 axles per day. The coupling-pin plant consists of five machines and five furnaces, with an annual capacity of 10,500 tons. For making links, the works have eight hammers and ten furnaces and six machines and six furnaces, and can make 12,000 tons of links per annum. The machine-shop is stocking up with a large amount of heavy tools: A 60-foot lathe, swinging 60 inches, made in Scotland, and weighing 56 gross tons; a 30-inch stroke slotter, weighing 32 tons, made in Philadelphia; a boring-mill, swinging 16 feet 1½ inches between housings, made at Hamilton, O., and weighing upward of 40 net tons; and a planing-machine, which planes 6½ feet square and 25 feet, with bed 40 feet long and a table traverse of 52 feet, made in Philadelphia, and weighing 36 tons.

The Otis Steel-Works, at Cleveland, have the tracks of the Lake Shore & Michigan Southern Railroad passing on the north, and those of the Cleveland & Pittsburg on the south side. The works have an open-hearth plant, consisting of two seven-ton and four fifteen-ton furnaces, the former having an average capacity, nearly, of 100 tons, and the latter of 200 tons each per week of eleven turns. The maximum has been 125 and 270 gross tons respectively. Pig and scrap or pig and wrought-iron are the raw materials used, no preheating being done. Bottom casting is exclusively practiced at the works, the arrangement being a modification of that originally introduced in Bessemer practice. The product is ingots for variety of purposes, and direct castings, principally heavy work, such as rolls. The plant, if pushed to its utmost capacity, is believed to be able to make forty thousand tons per annum. The most interesting feature of the plant is the Wellman plate-mill, trains of the same design being at work or building at Schoenberger & Co.'s, Pittsburg, the Spang Iron and Steel Company, Pittsburg, and the Springfield Iron Company, Springfield, Ill. The mill is driven by a Porter-Allen high-speed engine, having a cylinder 40 inches in diameter, with 48-inch stroke, and running at a speed of 100 revolutions, with a steam pressure of 80 pounds. The ingots are reheated in three furnaces. The train is three-high, the upper and lower rolls being driven, while the middle roll is an idler. The upper roll is raised and lowered by counterweighted levers. The length of the rolls is 112 inches, the diameter of the upper and lower rolls being 31 inches, while that of the middle roll is 20 inches. They run at a speed of 67 revolutions per minute, and roll down ingots to the well-known Otis plate in one heat. The mill has besides one three-high sheet train driven off the end of the blooming train, and a merchant mill driven by a horizontal engine with 28-inch cylinder and 48-inch stroke. The axle forge contains four Cuyahoga hammers. A recent addition to the works has been a mechanical puddler driven by a two-cylinder horizontal engine.

The Cleveland Rolling-Mill Company recently turned out 100,280 pounds of No. 5 steel wire in one shift, J. P. Edwards having charge of the rolls.

The St. Louis Ore and Steel Company is introducing the Gustin patent hot-bed and straightening apparatus in its rail-mill. This improvement is expected to increase the product 25 per cent, and will save considerable labor.

A well sinking for natural gas by the Central Glass-Works Company, of Wheeling, at a depth of 840 feet, after piercing a thick vein of sand-rock, struck a strong flow of gas. It was conducted from the mouth of the well in pipes and lighted, making a blaze thirty feet high. The gas will be used for fuel in the glass-house. This is the fourth well which has been successfully drilled through to a gas-vein.

Joseph Corns, after a prosperous three years as lessee of the Massillon Rolling-Mill has concluded arrangements by which he and his son became owners of the mill, under the firm name of Corns & Son. It is the intention to enlarge the works considerably, increasing also the working force, which now consists of 150 men. The mill has been running uninterruptedly during all the recent period of depression and uncertainty in the iron trade.

The converting department of the Cambria Iron Company's steel plant is connecting with furnaces Nos. 5 and 6 by means of two railroad tracks, which, when completed, will be used for conveying molten metal directly from the furnace to the converters.

William Todd & Co., founders and machinists, Youngstown, O., have just cast for the Delaware iron mine, in Michigan, three drums, which are 14 feet in diameter and 7½ feet high, and are each cast in one piece, but so arranged that they will easily split in three pieces, for convenience in shipping. Each drum weighs twelve tons, and will hold a cable nearly a mile long. These are undoubtedly the largest drums ever cast in Ohio.

H. K. Porter & Co. have under way at their light locomotive-works a locomotive for pushing rail blooms at the Scranton Steel-Works. It weighs but about three tons, and is only two-foot gauge. The cylinders are five inches diameter and 10 inches stroke. There is no cab, as it will run inside of the steel mill.

The Springfield Iron Company, of Springfield, Ill., expects to have its new steel boiler-plate train running at an early date. It will roll plates up to nine feet wide.

Messrs. Howard & Morse, of this city, have issued a catalogue descriptive of the Blackman power ventilator, an exhaust-wheel which has been coming into favor rapidly for a variety of purposes, prominent among which are the ventilation of dwellings, hospitals, theaters, vessels, mines, the exhausting of steam, moisture, dust, noxious gases, etc.

Among the recent contracts secured by the Porter Iron Roofing Company, Cincinnati, Ohio, are the following: Iron roofing and siding to cover all the buildings of the Western Nail Company, Belleville, Ill. Iron roofing and siding for the Isabella Furnace, Barneston, Pa. This was made of galvanized iron, the best and most expensive. Galvanized iron, No. 20 gauge, for the County Buildings at Winnemucca, Nevada. Iron roofing and siding for oil-works at Newport, Arkansas. Roofing and siding for Chicago Tire and Spring-Works, Chicago, Ill. Iron roofing for large mill at Socorro, New Mexico. Iron roofing for the match-works at Brownsville, Me. Iron roofing for large smelting-works at Tombstone, Arizona.

MINERAL PATENTS GRANTED BY THE UNITED STATES LAND-OFFICE.

The following mineral patents will be promulgated by the General Land-Office the present week as of date July 1st:

CALIFORNIA.

MARYSVILLE DISTRICT.

Abbott Quicksilver Mining Company, Abbott quicksilver mine.

COLORADO.

CENTRAL CITY DISTRICT.

Paul Lindstrom, placer. Edgar Freeman, Rising Sun lode. Joshua S. Reynolds, Specie Payment lode. John G. Roberts, Camel lode. Charles M. Hill *et al.*,

Buena Vista lode and mill-site. Charles F. Wells, Arabian lode. Charles W. Pollard, Olympic and Titan lodes. Thomas McCallister, IXL lode. Samuel Heilner, Great Sphinx and Cleopatra lodes. Mary G. Arnett, I. O. U. lode. Park Disbrow, Etta Disbrow lode. Cornelia C. Munson *et al.*, Badger lode. Jabez Rippin, Lucas lode. Nels Johns, Enterprise lode. Michael Kelly, Big Spring lode. H. J. Robbins *et al.*, Old Timer lode.

DEL NORTE DISTRICT.

Alexander H. B. Harenc, Radcliff lode.

LAKE CITY DISTRICT.

W. Weston *et al.*, Iron Clad lode. Herman Beckants *et al.*, San Juan lode.

LEADVILLE DISTRICT.

Scott Hayes, Wisconsin lode. John W. Reed *et al.*, Lillie lode. W. S Ward, Bismarck lode. J. O. Hudnutt *et al.*, Bonanza King lode. John McGranahan *et al.*, City of Durham and Little Rose lodes. Charles O. Edman *et al.*, Mobile lode. Theodore A. Fellows *et al.*, Old King Cole lode. W. J. Wilson *et al.*, Carleton lode. Charles J. Moore *et al.*, F. C. Garbutt lode. New York & Colorado Mining Syndicate and Company, Patch lode. Mathias Stauffacher *et al.*, Little Annie lode. James Camoran *et al.*, Camoran lode. J. C. Taylor *et al.*, G G lode. James C. Spenas, Yale lode. Chippewa Consolidated Mining Company, Comstock lode.

PUEBLO DISTRICT.

Christian Wahl *et al.*, Dakota Maid and Boss lodes. C. L. Wall *et al.*, Queen of the Valley lode. Lumber City & Silver Cliff Mining Company, Copper King lode. Richard Irwin *et al.*, Cymbeline lode. Valley City Mining Company, California lode.

NEVADA.

CARSON CITY DISTRICT.

Ferdinand S. Van Zandt, Brooklyn, Copper, and Galatia lodes. Manuel San Pedro *et al.*, San Francisco lode.

EUREKA DISTRICT.

C. L. Bray *et al.*, Kemp & Keene Consolidated lode.

NEW MEXICO.

Benjamin F. Gumm *et al.*, Miguel Otero lode.

MONTANA.

HELENA DISTRICT.

Joseph Rosenthal *et al.*, Mapleton lode. Michael C. Cotter *et al.*, Empire lode and mill-site. John J. McRae *et al.*, Glengarry lode.

UTAH.

SALT LAKE CITY DISTRICT.

Benjamin Bachman *et al.*, Governor lode. Thomas J. Gibbons *et al.*, Benton lode. M. J. Snedaker *et al.*, Allegan lode. Lars S. Anderson, coal.

GENERAL MINING NEWS.

ARIZONA.

COCHISE COUNTY.

TOMBSTONE MILL AND MINING COMPANY.—The following dispatch, just received, shows the June output from the mill and furnace to be $91,400 gross. The fourth level of the West Side is opening in a good body of high-grade ore. The new strike in the Tough Nut has increased in size and value at a depth of seventy feet. The local papers say that the company is now purchasing all the smelting ores it can get, and is paying the highest market price for them.

GRAHAM COUNTY.

GLORIETTA.—This company owns seven claims located about a mile and a half southwest of the Detroit Company's mines. It has already spent $2500 in development-work. Work has been resumed on the Micawber. A shaft 100 feet in depth has been sunk on this claim, and two levels started, one at 50 feet, which is in 25 feet; and another at 75 feet, which is in 15 feet. The company proposes to run the latter level 50 feet farther, through the deposit of iron, and then to sink another shaft.

PIMA COUNTY.

The Caledonia copper group, twenty miles south of Picacho station, on the Southern Pacific Railroad, has been sold to J. D. Power. The ore gives an average of 26¼ per cent copper.

CALIFORNIA

MONO COUNTY—BODIE DISTRICT.

BODIE CONSOLIDATED.—The average assay value of the pulp is $36.42 per ton; that of the tailings, $5.90 per ton. There were 209 car-loads of ore hoisted from the mine, 145 car-loads of which were from the 740 to 770 foot levels.

STANDARD CONSOLIDATED.—There were extracted and shipped to the mills 1461 tons of ore during the past week.

SYNDICATE.—The mill is running on ore from the mine.

PLUMAS COUNTY—GREENVILLE DISTRICT.

CRESCENT.—At the mine, all work except pumping is suspended.

GOLD STRIPE.—The mill has been started up, but will be kept running day shift only for some time. Some prospecting is kept up, and upon the result of this, future operations will depend.

GREEN MOUNTAIN.—No new developments yet to report in the big tunnel. The drift goes ahead rapidly and steadily. The ledge does not yet prospect enough to warrant milling any of the ore. In the mean time, ore enough is taken from the upper tunnels to keep both mills fully supplied.

COLORADO.

BOULDER COUNTY.

KEYSTONE.—The mine is now worked after many years of idleness. A portion is worked on a lease.

MOUNTAIN LION.—This mine has been recently purchased by Eastern capitalists, who purpose to develop it extensively. A forty-stamp mill is to be erected shortly.

SENATOR HILL.—The mine has been making regular shipments for some time. The developments consist of three shafts, all of which are in pay. The property is worked on contract.

CHAFFEE COUNTY.

The following statement shows the large amount of development-work done in the various properties in Monarch District:

	Feet.		Feet.
Black Tiger, tunnel	429	Buck's, tunnel	400
Black Tiger, shaft	75	Middle Fork, tunnel	290
Monarch, shaft and drift	837	Mount Ætna, tunnel	400
Eclipse, tunnel	620	Greeley, tunnel	120
Eclipse, shaft	130	Columbus, tunnel and drifts	3000
Silent Friend, tunnel	117	Tabor, tunnel	650
Cræsus, tunnel	200	Beta, tunnel	612
Gene Moore, tunnel	300	Beta, shaft	140
Lost Wonder, tunnel	359	Zephyr, shaft and drift	642
Lexington, tunnel	195	Buda, shaft and drift	400
Michigan & Big Chief, tunnel	140	Denver, tunnel	889
Continental Divide, tunnel	452	Kangaroo, tunnel	1500

The grading of the railroad from Maysville to Garfield and Chaffee is nearly completed and ready for ties. A force of from 200 to 300 men is kept constantly at work, and it is expected that the cars will be running by August 15th, when the output of the Monarch District will be greatly increased.

CLEAR CREEK.

Following is a statement of ore-shipments from Georgetown and vicinity during the month of June:

Shipped from	Tons.	Value in dollars
Boston & Colorado Works	415	$52,700
Silver Plume Sampling-Works	202	20,200
Miners' Smelting Company	150	16,000
Mendota Lode	82½	6,485
G. W. Hall & Co	40	8,000
A. P. Stevens (estimated)	150	30,000
Total	1,039½	$133,385

BRITISH QUEEN.—The tunnel which has been started at the base of the mountains is now in 125 feet, and will intersect the old Baker mine at a distance of twenty-five feet more. Contracts will then be made to run it 200 feet farther. The Baker mine has over one mile of levels, shafts, and winzes, that produced large sums of money ten or twelve years ago and have been mostly abandoned since. The company has commenced, within the last year, to clean out these old openings, with very satisfactory results.

GOLDEN LEAF.—The mill for the reduction of the quartz taken out of this lode, on Soda Creek, will be in running order shortly. The shaft on the lode is about 90 feet deep, and the character of the free-milling ore is still unchanged. A new adit has been started on the vein close to the mill, which shows stamp-dirt three feet wide. When the mill is in running condition, it is the intention to treat custom ore for all those developing mines in close proximity to the above property, and for no others.

NEW YORK & COLORADO.—A contract has been made with Messrs. Fraser & Chalmers, of Chicago, for the erection of a fifty-ton stamp-mill.

REPUBLICAN MOUNTAIN.—This company, an English incorporation, has been steadily driving its Everett tunnel ahead, on Republican Mountain. It is in from 700 to 800 feet, having already cut the Morning Star lode, being within 100 feet of the Edward Everett, and having at least three patented lodes to cut within the next 400 feet, all belonging to this company. On the Morning Star, a drift has been run some 100 feet westerly of the tunnel, and a shaft raised to surface. The tunnel cuts it at a depth of 250 feet. The ore milled runs from 300 to 500 ounces silver. As soon as all the company lodes in the line of the tunnel have been cut, systematic development of each of them is proposed. Among other properties included within the company's patented properties are the Alhambra, Ogden, and Parr claims, with several hundred feet of shafts and other developments.

SNOWDRIFT.—Major Fulton has received a favorable five years' lease and bond on this mine, and will work it hereafter on his own account.

DOLORES COUNTY.

RICO REDUCTION COMPANY.—The works which were recently started, says a dispatch from Rico, prove a perfect success with the local ores. These works have been enlarged and improved since last year.

GILPIN COUNTY.

KING.—The main shaft has now attained a depth of 315 feet. The ore assays 1½ ounces of gold, 18 ounces silver, and 54 per cent lead per ton. Sinking will be resumed as soon as a contract for 100 feet can be let.

RARA AVIS.—Work has been stopped at the Whitney mine, owing to defective hoisting machinery. It is rumored that the company will remove the engine and boilers from the mill building to the mine. There is a sufficient capacity to hoist from a depth of 1000 feet.

VALLEY VIEW MINING AND MILLING COMPANY.—The annual meeting was held in Central City recently. On the return of the President, work will be resumed upon the property, the larger portion of which has been developed.

GRAND COUNTY.

READY CASH.—A strike of some importance has been made in this mine. A fine streak of mineral of a high grade, varying in thickness from fourteen to eighteen inches, was encountered in the cross-cut tunnel driven to tap the Ready Cash. The tunnel is in over 200 feet.

LAKE COUNTY.

The Leadville *Herald* gives the following statement of the bullion production for the quarter ended June 30th. The Royal Gorge is estimated:

Source.	Tons of lead.	Ounces of silver.	Ounces of gold.	Value.
Arkansas Valley (bullion)	2,051¾	357,786	877	$595,757.60
Arkansas Valley (ore)	1,953½	196,348	..	391,779.80
La Plata Smelter	1,772	331,315	840	540,726.50
Cummings & Finn	1,937	325,316	195	536,077.60
Harrison Works	1,572½	119,208	1,036	293,328.80
American Smelter	1,500	135,000	1,582	315,140 00
Elgin Smelter	96	11,462	118½	23,551.20
Eddy, James & Co (ore)	6,996	831,865	.....	1,544,682.66
Royal Gorge, Cañon City (ore)	400	35,455	.. ..	75,000.00
Leadville G. & S. Mill	.....	55,768	.....	61,344.80
Shields Mill	.....	7..71	12½	8,250.00
Tabor Mill	.....	20,296	16	22,645.60
Miscellaneous	.....	2,000	200	6,520.75
Total second quarter	18,278¾	2,429,120	4.877	$4,414,815.31
Total first quarter	.....	.....	.....	3,662,662.00
Total for six months of 1882	.....	.....	.....	$8,077,477.31

In the above calculations, lead is figured at $90 per ton; silver, at $1.10 per ounce; and gold, at $20 per ounce.

The *Herald* reports the ore output of the mines situated on the different hills at Leadville for the month of June as follows:

	Tons.		Tons.
Carbonate Hill	5,701	Printer Boy Hill	1,030
Yankee Hill	1,376	Fryer Hill	4.604
Breeze Hill	1,243	Little Ella Hill	1,340
Iron Hill	17,402	Sugar Loaf Mountain	310
Rock Hill	1,851		
Total			34,857

CATALPA.—The mine produced, during the month of June, 945 tons of ore. The output is the result mainly of tribute-workers. Exploration-work carried on in the eastern portion of the property has not met with the success anticipated. The rises made from the incline driven eastward from the bottom of the upper shaft have reached the limestone and porphyry contact. At the points where the contact was cut by the rises, it was found destitute of contact matter and ore, the two formations making a close contact. The next movement will be the exploration of the northeast corner of the Catalpa claim, near the line of the Evening Star mine. Negotiations are in progress with the Colorado Iron and Steel-Works. If that company will pay four dollars a ton for the iron ore of the Catalpa, the manager will contract to supply the company with from fifty to one hundred tons of ore per day. The ore contains from fifty to sixty per cent of metallic iron, a small quantity of manganese, and only a trace of silica. Assays show the ore to have a value of from two to seven dollars in silver to the ton,

which is not enough to make it profitable ore to mine and reduce for the silver it contains.

CHRYSOLITE.—The company has begun the shipment of iron ore to Billings's smelter in Utah. The iron is to be used as a flux in lead smelting, and trial lots only have been sent so far.

HENRIETT.—At present, the mine shows greatly increased resources, and a very large production of ore may be looked for in the future.

SUMMIT COUNTY.

ROBINSON.—It is stated that the directors have acceded to the request of Mr. Greer for a modification of his lease, and that a new lease was signed on the 28th ult., which alters the royalty payable by Mr. Greer in several important respects, relieves the lessee from the duty of erecting concentration-works at the mine, and divests the lease of some of its most objectionable features. It now remains to be seen how it will work in practice. Mr. Greer returned on the 4th. The shipments vary from four to five cars a day, and the grade remains the same. In June, the total shipments were 87 cars, as against 92 in each of the two previous months, the falling off being due to the temporary stoppage of work, due to the water.

DAKOTA.

Much work will be done this summer in the tin mines recently discovered in the Harney range.

ALTA-LODI.—A complete reorganization of this company has been made, and work will be resumed upon the mines some time in August.

CALEDONIA.—The superintendent reports, June 24th: Ore produced, 1050 tons. The pump is in place in the winze, and a good incline track is down. Will start drifts to-morrow. The mill is running to its full capacity.

FATHER DE SMET.—The superintendent's report, for week ended June 30th, shows: Ore extracted from first, second, and third levels, 2750 tons. Ore milled, 2700 tons. Golden Gate north header in 158 feet: tramway level rise up 80 feet.

GARFIELD.—This company has a force of men employed upon the Charter Oak and other mines on Silver Creek.

STAND-BY.—Under the arrangement made between the company and the Boston capitalists, the latter will construct railroads to other mines in the vicinity, and keep the mill running to its full capacity. This contract is to hold good at least two years. Other mining property, water-rights, etc., in the immediate vicinity will probably be purchased by the company, and it is stated that negotiations for several transfers are already opened. Work will shortly be commenced on the Stand-by property, with the intention of thoroughly testing its value, and a large quantity of ore will be milled during the present year.

GEORGIA.

CONSOLIDATED GOLD MINING COMPANY OF GEORGIA.—The treasurer's report, presented at the third annual meeting, shows receipts and disbursements as follows:

RECEIPTS.

Proceeds of bullion, Ivey mine	$38,289.64
Proceeds of bullion, Bast mine	22,482.11
Dividends on 13,130 shares treasury stock	5,877.20
Proceeds sale treasury stock to pay for right of way for new ditch	1,000.00
Balance on hand June 1st, 1882	199.38
	$67,848.33

DISBURSEMENTS.

Expenses at Ivey mine	$10,022.24
" " Bast mine	9,932.87
Construction account of Ivey mine, including right of way for new ditch	1,775.97
Office expenses	1,847.69
Dividends	44,000.00
Balance on hand June 1st, 1883	267.56
	$67,848.33

The superintendent states that, during the year, seventeen miles of canal to convey the waters of Cane Creek to the Ivey mine have been built, with sufficient reservoirs for the storage of water. This is an exceedingly valuable work, as it gives a supply of water for hydraulic work, and also furnishes power for running the mill. The new sixty-stamp mill has been completed, and the work done at the Bast and Ivey mines has been going on steadily with favorable results.

MAINE.

Reports are, that the Blue Hill mining camp is a busy place at present. The Douglass, Stewart, and Blue Hill mines are actively at work, and, collectively, employing a large force of men. The Douglass is steadily producing and shipping refined copper, and good progress is made in the construction of the calcining-furnace.

EDGECOMB.—This mica mine is vigorously developed. It is situated in the town of Edgecomb, about three miles from Wiscasset. The product of this mine is said to be equal to the best North Carolina mica. In mass it is wine-colored, but, when split, is white. There seems to be an inexhaustible supply; and the deeper the shafts are sunk, the better the quality.

MICHIGAN.

The production of the mines named is given for the month of June as follows:

	Tons.
Calumet & Hecla	1754
Quincy	275
Franklin	177
Atlantic	159
Allouez	112
Pewabic	68
Peninsula	58
Wolverine	46

CHAMPION IRON COMPANY.—A portion of the company's lands, located in the vicinity of Michigamme, has been leased to parties who will explore it for gold, the latter being said to exist in quantity sufficient to warrant a thorough search.

ETNA.—The company has paid the stipulated bonus of $10,000 for the privilege of mining ore at a royalty of 75 cents per ton.

ILLINOIS.—Work will be resumed in the near future, probably under an arrangement with one of the most prominent companies operating on the range.

MCCOMBER.—Operations have been resumed.

MONTANA.

JEFFERSON COUNTY.

GREGORY CONSOLIDATED.—The extraction of ore at the present time is confined principally to the third and fourth levels. The daily output is about 35 tons, which will be largely increased on the completion of a projected concentrator that will have a daily capacity of 100 tons. The smelting capacity of the company will be amply sufficient to treat the product of both the old and the new concentrator on the completion of the latter. In the mean time, it is the intention of the company to take all necessary measures for the energetic and deep development of the mine. A new hoist with a capacity to sink 1000 feet has been already ordered, and will be started into operation as soon as possible. The facilities of the company for the easy and comparatively inexpensive reduction of Gregory ore are exceptionally good. Wood and water are in abundance, with nearness of plenty of fluxing ores and the certainty of early opportunities for cheap railroad transportation.

SILVER BOW COUNTY.

ALICE.—The mines of this company are looking well. The ore-house is full, and the eighty-stamp mill is running regularly.

BELL.—Drifting has been commenced from the old workings in the 240, to connect with the new shaft at the 270. The 400-foot station is nearly completed, when a north drift will be started from that level, to tap the vein underneath the old workings, to which an uprise will be run. The smelter is making a successful run. The concentrator is repairing, and will be started up on ore from the low-grade dump.

MOULTON.—Reports show the usual amount of development-work. The ore uncovered is of a good grade. A streak in the ledge about twelve inches wide assays as high as 400 ounces. The mil is running steadily.

NEVADA.

GEDDES & BERTRAND.—The mill is running regularly, reducing about 60 tons of ore that goes from $24 to $29 per ton. The cost of treating is said to be $3 for mining and $6 for milling.

GRAND PRIZE.—The Grand Prize-Argenta hoisting-works at Tuscarora were burned to the ground June 30th. The loss by the fire is $30,000, the outlay necessary to replace the building and machinery. There was only $10,000 insurance.

NEW HAMPSHIRE.

MASCOT.—Another rich strike of ore is reported on this property at Gorham. The vein in the tunnel at the base of the mountain, which has shown well hitherto, has been steadily improving in appearance as work progressed, and among the many streaks of galena with which the vein-matter is interspersed is one more than four inches in width. The mine is showing most encouraging prospects. The work of development is carried steadily forward, and meanwhile, preparations for the erection of the concentration-works are progressing favorably.

NEW MEXICO.

According to the Albuquerque *Journal*, the injunction obtained lately by Brunswick & La Rue against H. B. Ferguson, who represents the interests of the Jack Winters heirs in the North Homestake mine at White Oaks, has been dissolved by Judge Bristol, after a full hearing.

Work has been commenced on the large smelter of Mr. Billings, at Socorro. It is going to be at present a two-stack of 100 tons capacity daily. It has machinery capable of running 400 tons by supplying the additional furnaces. There are about sixty men at work now, and it will be completed by August 15th, for treatment of the Kelly ore. The railroad track is partly completed to the smelter, and cars will be run to it very shortly.

OHIO.

The vein of mica in Jackson township is still undeveloped, the parties discovering having thus far failed to secure a lease of it. They claim to know exactly where it is, but decline to give any information either to the owner of the farm or to any one else before securing the lease.

UTAH.

The Salt Lake *Tribune* gives the following statement of bullion receipts in that city for the first half of 1883. The ore receipts have been excluded, because the ore reduced in the furnaces there appears for its full value in the bullion shipments of the smelters. The table, however, by no means includes all the bullion production of Utah. The Mingo smelter makes no daily or weekly reports, and its work is not included. Other smelters, also, are not reported. None of Silver Reef except the Stormont is given. The immense ore-shipments of the Crescent, going for the most part directly to their destination outside the territory, are also not reported. It is estimated that, if all were included, the bullion product for the half-year would amount to four millions and a half. January, $473,025.83; February, $577,041.24; March, $664,571.66; April, $563,341.77; May, $506,565.10; June, $453,480.20. Total, $3,238,025.80.

The Copper Belt mill, at Marysvale, has been consolidated with the Pluto mine, for the purpose of working its ores, and the mill is to be put in operation as soon as possible. Messers. Holderman and Nicholson have gone there for the purpose of pushing work on the mill, and they hope soon to be producing metal. This consolidation extends only to the mill and mine, and not to the Pluto Mining Company.

SILVER REEF.

Wells, Fargo & Co.'s shipments of silver from Silver Reef, for the month of June, amounted to $36,924.14.

VERMONT.

VERMONT COPPER MINING COMPANY.—The New York *Tribune* states that the probable result of the recent strike and riot at Vershire will be that the company will fall into the hands of a receiver. The actual condition of the affairs of the company and the prospects of the mine are briefly stated as follows: There is a bonded indebtedness of half a million dollars, with interest past due. The floating indebtedness is nearly $200,000. The corporation which owned the mine for many years previous to a year or two ago was known as the Vermont Copper Mining Company, Smith Ely, President. The miners, up to within a few months, worked at contract prices, and, after the decline in copper, the output of ore was done at a loss. The company became involved in financial difficulties and litigation last year. The Vermont Copper Company was formed to succeed the old corporation, with E. Ely Goddard, President. F. M. F. Cazin was manager under the company, and the firm of Goddard & Cazin run the corporation store. It is claimed that Cazin expended a large sum of money in worthless improvements, a crushing-mill being built at an expense of $30,000, which has not been used. At last, the property was deeded back to the Vermont Copper Mining Company. Bonds were issued and the creditors of the company were paid largely in these securities. Meanwhile Goddard sued Cazin for libel. The firm of Goddard & Cazin dissolved partnership. Cazin was arrested. Application is made by Cazin for the appointment of a receiver of the property. Attachments have been laid on the property, including one in the name of the Eagle National Bank of Boston for $20,000. One week ago, the men refused to go to work. The president of the company, Smith Ely, declined to pay the miners their just dues. He also refused to put any more money into the business.

VIRGINIA.

VIRGINIA STATE MINING COMPANY.—An excellent quality of roofing slate is quarried from the company's 4040 acres tract at Snowdon, near Rope Ferry station of the Richmond & Alleghany Railroad, Amherst County, twenty-four miles west of Lynchburg, where it has a bed of slate three miles long and three quarters of a mile wide. These slates are on the eastern slope of the Blue Ridge, and very convenient to the railroad.

WYOMING.

The copper mines at Hartville are producing a large amount of copper. The smelter is running continually, the mines are developing, and there is already more ore on the dumps than the smelter can treat for some time to come. The mines are producing largely, and, taking into consideration the fact that they were discovered only three years ago, the outlook is very favorable.

The last find reported near Cheyenne promises to be of great value. An Iowa company has been at work for several weeks on a quartzite ledge, near Buford station, on the Union Pacific Railroad, and at the bottom of the new shaft has struck native copper scattered in fine grains and leaves, all through the vein. The ledge is over 120 feet across, and cuts the formation at nearly a right angle.

FINANCIAL.

Gold and Silver Stocks.

NEW YORK, Friday Evening, July 13.

Our mining market has shown a slight increase in activity compared with the small dealings of the past weeks. The sales, which were pretty uniformly distributed—more so than usual, in fact—aggregated 224,910 shares, against 138,740 last week.

From the Comstock there has been no news, authentic or otherwise, to affect values, which have on the whole, however, exhibited a little more strength. California has reacted slightly, sales ranging between 11@15c., while Consolidated Virginia has fallen off from 45c. in the beginning of the week, to 40c. at the close. Sierra Nevada fluctuated between $3.40@$4.50, closing at $4.35, while Union advanced from $4.75@$5.50, and closed to-day at $5.25. Sutro Tunnel held its own.

The Leadville stocks exhibited signs of weakness, Iron Silver quietly holding at $2.95@$3.10, the latter being higher than usual. We refer editorially to the successful issue of some of the litigations in which this mine is involved. Amie, Little Pittsburg, and Climax have been weak, while Chrysolite, under active trading, advanced to $1.30, but declined later on, closing at $1.20. There was little interest in the other Leadville stocks.

Bodie stocks have excited no more interest than usual. Standard has held its own. Bulwer reached $1 on Saturday, but records no sales since then.

Among the Tuscarora stocks, Navajo has again rallied, advancing from $2.25@$3, closing at the latter figure. The rest have been quiet.

In the miscellaneous list, we note particularly, as the first transaction for a long period, the sale of 1000 shares of St. Joseph Lead at $7. Alta-Montana has reached bed-rock at 1c. per share. The mine was sold under foreclosure proceedings this week for $719,000. The bulk of the indebtedness of the company is to local bankers. Eureka has dropped off under light sales to $4.50. Aside from the poor outlook for the mine, the future of lead is not promising. Horn-Silver, after advancing to $7.75, declined and closed at $7. Northern Belle has been a little more active than usual, and has held its own. Silver King has dropped off to $9. Sonora has been the most active stock on the list, recording over 100,000 shares, advancing from 18 to 40c., but closing at 25c.

At a recent meeting of the Henriett Mining Company in London, organized to work the Henriett mine of Leadville, it appears that the English engineer, Mr. Henty, who reported on the mine, very much overestimated the reserves. Mr. Moffatt, the vender, has signified his willingness to pay 20s. each for all shares offered previous to the 27th of July, the shareholders retaining the two dividends of 2 per cent each which they had received.

Another Leadville mine has been launched on the London market. This time it is the Silver Cord, with a capital of £100,000 in £1 shares, £10,000 cash being asked.

The stock operations of the palmy days of mining speculations have left behind them a fruitful crop of litigation, among which we may note the suits of Sylvester H. Langdon, a stockholder of the Mack Morris Mining Company, against Clinton B. Fisk, José F. Navarro, A. V. Stout, and others; and of E. Nutt against the trustees of the Nueve Minas de Santa Maria, one of the Roberts schemes. Mr. Nutt alleges that the mining land owned by the company, in the State of Sonora, Mexico, was purchased for $17,000 from its original owner, and that the purchaser for this sum then sold it to the company for all but seven of the 100,000 shares into which its capital stock of $25,000,000 is divided. He charges that the property was certainly not worth more than $500,000, and that the purchase of it by the company for stock representing a par value of $24,999,825 was a fraud, particularly in view of the fact that most of the shares were given by the seller of the land back to the trustees of the company or their nominees, and by them put on the market for their own benefit as full-paid stock. He purchased 300 of the shares at $2 each, and he now seeks to compel the trustees to account to the company, for the benefit of himself and other stockholders, for the $24,000,000 of stock which he alleges they have fraudulently obtained and disposed of to their own advantage.

MEETINGS.

Dunderberg Mining Company, Nos. 90 and 92 Broadway, Room 37, New York City. The adjourned meeting of the stockholders for the election of trustees, and such other business as may be presented, will be held August 1st, at three o'clock P.M.

DIVIDENDS.

The Castle Creek Mining Company, of Idaho, has declared its regular monthly dividend (No. 14) of three per cent, payable July 16th.

The Copper Queen Mining Company, of Arizona, has declared a quarterly dividend of $125,000, payable on July 16th, 1883. Transfer-books close July 13th, and reopen July 17th.

The Mount Pleasant Mining Company, of California, has declared a dividend (No. 2) of fifteen cents per share, payable at the office of Messrs. Laidlaw & Co., No. 14 Wall street, New York City, July 16th.

The Homestake Mining Company, of Dakota, has declared its usual monthly dividend of $50,000, payable on the 25th inst., at the office of Messrs. Lounsbery & Haggin, No. 15 Broad street, New York City.

The Quincy Mining Company, of Michigan, has declared a dividend (No. 30) of $3.50 per share, payable August 15th, to stockholders of record July 24th.

PIPE LINE CERTIFICATES.

The week has been one of considerable activity and of considerable excitement, the market giving way. The official figures of the United Pipe Lines (in barrels) for three months are as follows:

U. P. L.	April. 1883.	May, 1883.	June, 1883.
Net stocks	33,123,726	33,366,470	33,656,342
Certificates issued	25,393,241	27,084,933	28,591,101
Credit balances	7,730,485	6,281,537	5,065,241
Receipts	1,856,793	1,895,283	1,842,012
Deliveries	1,584,047	1,637,203	1,536,751
Excess receipts	272,746	258,080	305,261

A comparison of the June report with that of a year ago is given below in barrels:

U. P. L.	June, 1882.	June, 1883.		Changes.
Net stocks	26,966,476	33,656,342	Inc.	6,689,866
Certificates issued.	21,282,496	28,591,101	Inc.	7,308,605
Credit balances	5,683,980	5,065,241	Dec.	618,739
Receipts	2,419,935	1,842,012	Dec.	577,923
Deliveries	1,796,712	1,536,751	Dec.	259,961
Excess receipts	623,223	305,261	Der.	317,962

The following table gives the quotations and sales at the New York Mining Stock and National Petroleum Exchange:

		Opening.	Highest.	Lowest.	Closing.	Sales.
July	7	$1.14⅝	$1.14⅞	$1.13⅜	$1.14⅝	1,975,000
	9	1.14⅝	1.14⅝	1.13¼	1.14⅜	2,080,000
	10	1.14⅛	1.14⅛	1.12½	1.12½	2,011,000
	11	1.12⅝	1.12⅝	1.11⅜	1.11⅞	2,112,000
	12	1.10¾	1.12⅛	1.09⅝	1.11¼	3,978,000
	13	1.09⅛	1.09⅝	1.06⅝	1.08⅛	5,044,000
Total sales						17,200,000

SAN FRANCISCO MINING STOCK QUOTATIONS.
Daily Range of Prices for the Week.

NAME OF COMPANY.	CLOSING QUOTATIONS. July 6.	July 7.	July 9.	July 10.	July 11.	July 12.
Albion	....	....	....	....	....	....
Alpha	....	1¾	2	2	2	2
Alta	.50	.75	.80	.90	1	1
Argenta	....	....	.10	....	.05	.05
Bechtel	....	....	....	....	....	....
Belcher	1¼	1¼	1¼	....	1¼	1¼
Belle Isle	.40	....	....	.45	.45	....
Best & Belcher	4¼	4¼	4½	4¼	4⅜	4¼
Bodie	.80	.75	.60	.65	.70	.75
Bullion	....	....	....	....	....	....
Bulwer	1⅛	....	....	....	....	....
California	.10	.10	.05	.10	.15	.15
Challar	3⅜	3½	3½	3⅜	3½	3½
Con. Virginia	.50	.45	.45	.45	.45	.40
Crown Point	1¼	....	1½	1⅜	1⅜	1⅜
Elko Cons	....	....	....	....	....	....
Eureka Cons	5¾	....	6	5	4¾	4½
Exchequer	....	....	....	....	....	....
Gould & Curry	2⅜	2½	2½	2⅜	2½	2½
Grand Prize	.05	.05	.05	....	.02	.05
Hale & Norcross	5⅞	5⅞	6⅛	5⅝	5⅞	6
Independence	.70	....	....	....	.60	.55
Martin White	5	5	5	....	....	....
Mexican	3	3	3⅛	3	3	3
Mono	....	....	....	....	....	....
Mount Diablo	....	5½	5½	4¾	4½	5
Navajo	2⅝	2⅝	2⅞	3⅛	3	3⅛
Northern Belle	7⅞	....	....	6½	7	6⅞
North Belle Isle	.20	....	....	....	....	....
Ophir	2¼	2½	2⅝	2½	2½	2½
Overman	....	....	....	....	....	....
Potosi	1⅜	1½	1½	1½	1½	1½
Savage	2	2	2	2	2	2
Scorpion	....	....	....	....	....	....
Sierra Nevada	3⅜	4⅛	4¼	4	4⅛	4¼
Silver King	10	9¾	....	....	....	....
Tip-Top	....	....	....	....	....	....
Union Cons	4⅝	5	5⅛	4⅞	5⅛	5⅛
Utah	....	....	2¾	2¾	2¾	2⅞
Wales Cons	....	....	....	....	....	....
Yellow Jacket	3¾	3¾	4⅛	4	4	4

Copper and Silver Stocks.

Reported by C. H. Smith, 15 Congress street, Boston, Stock Broker and Member of the Boston Mining and Stock Exchanges.

BOSTON, July 12.

There has been a little more animation in the market for copper stocks this week, and prices show considerable firmness, especially for the two leading mines. Ingot copper is steady at 15½ cents, and as the production for June of the companies above alluded to shows quite an increase over the same time last year, it is fair to suppose that, even at the present price of ingot, the mines will continue to be remunerative to the stockholders, which fact tends to bring buyers into the market for all the stock offered. Calumet & Hecla advanced from $242@$243, with sales of less than 50 shares all told for the week. The usual quarterly dividend of $5 per share has been declared, payable August 15th, to holders of stock July 14th. Quincy advanced from $49@$51½, with more than usual changing hands. The announcement of a dividend of $3½ per share had rather a depressing effect on the stock to-day, and it was freely offered at $50 regular to $49, seller 60. It was generally expected that the dividend would not be less than $5, the same as last year. Franklin sold at $10, the same as last week. Osceola declined from $20@$19½. Atlantic sold at $11. Huron, at $1⅝@$1½; and a small lot of Allouez at $1¾.

In silver stocks, at the old Board, there has been absolutely nothing doing. Sales of Bonanza at $2¼ @$2⅜, Sullivan at $1¼, and a small lot of Silver Islet at $4, tell the whole story. At the Mining Exchange, there has been more activity; but the trading has been confined to a few specialties, and prices do not show large fluctuations. Bowman continues to be the leading stock, with sales of about 17,000 shares at 27@33c. Massachusetts & New Mexico was rather dull in the early dealings at about 7@8c., but was more active to-day, with sales at 9c. The bonds are quoted at 16@18 per cent. Empire, rather quiet, but firm at 20@25c.

At the afternoon Boards, Huron sold at $1½. Sullivan declined to $1. San Pedro sold at 35c. Bowman, 26@28c. Massachusetts & New Mexico, at 9c. Catalpa, dull, 53c. bid, 56c. asked. Quincy, 49@ 50c. Silver Islet, $4 bid.

BULLION MARKET.

NEW YORK, Friday Evening, July 13.

The firmness noted in our previous postings was only temporary, in consequence of weaker Eastern exchanges, and, with lower sterling exchange here, our figures are reduced as per accompanying table. The market is weak and likely to go somewhat lower.

DATE.	London. Pence.	N. Y. Cents.	DATE.	London. Pence.	N. Y. Cents.
July 7	50½	110½	July 11	50 7-16	110¼
9	50½	110½	12	50 7-16	110¼
10	50½	110½	13	50 7-16	110¼

United States Assay-Office at New York.—Statement of business for the month ended June 30th, 1883:

Deposits of gold:		
Foreign coin	$181,000	
Foreign bullion	38,000	
United States bullion	444,000	
United States bullion (re-deposits)	114,000	
Jewelers' bars	73,000	
Refined gold	105,000	$955,000
Deposits of silver:		
Jewelers' bars	14,900	
Foreign coin	12,000	
Foreign bullion	15,500	
United States bullion (contained in gold)	5,700	
United States bullion (re-deposits)	1,850	
Bullion, Arizona	900	
Colorado	26,000	
Lake Superior	500	
Montana	65,500	
New Mexico	17,500	
Oregon	100	
Utah	62,600	
Refined silver	71,800	294,000
Total deposits		$1,249,000
Gold bars stamped	$1,331,332	
Silver "	377,117	1,708,450

Bullion Receipts at New York.—The bullion received from the mines at the various offices in this city during the week ended July 13th, as compiled from various sources, amounted to $176,000, as against $158,000 reported for the previous week. The receipts from January 1st, 1883, to date are $6,164,213.53.

Exports and Imports of Gold and Silver at New York.

Exports.

Week ended July 7th	$170,584
Corresponding week last year	216,100
Since January 1st, 1883	6,791,466
Corresponding period last year	36,157,334

Imports.

Week ended July 7th	$36,865
Corresponding week last year	58,127
Since January 1st, 1883	6,976,822
Corresponding period last year	2,005,380

Foreign Bank Statements.—The governors of the Bank of England, at their weekly meeting, made no change in the bank's minimum rate for discount, and it remains at 4 per cent. During the week, the bank lost £19,500 bullion; but the proportion of its reserve to its liabilities was raised from 35 3-16 to 42 5-16 per cent, against 39⅛ per cent at the same date last year. The bank, July 12th, gained £16,000 bullion on balance. The weekly statement of the Bank of France shows losses of 7,825,000 francs gold and 6,900,000 francs silver.

BULLION PRODUCTION FOR 1883.

We give below a statement showing the latest bullion shipments. These are officially obtained from the companies, where that is possible; and where official statements can not be procured, we take the latest shipments published in those papers nearest to the mines reported. The table gives the amount shipped for the week up to the date given, as well as the aggregate shipments to such date from the first of January, 1883.

The shipments of silver bullion are valued at $1.29·29 per ounce troy; gold at the standard $20.67 per ounce troy. The actual value of the silver in the following table is therefore subject to a discount, depending on the market price of silver. If the price of silver be counted at $1.11 an ounce, which has for some months been about its average value, the following figures, where they relate to silver bullion, should be diminished by about 14⅛ per cent, to arrive at actual value.

Mines.	States.	Month of June.	Year from Jan. 1st. 1883
*Alice, G. S.	Mont		$398,410
*Alta-Montana, G. L. S.	"		$10,625
*Belmont	"		17,775
Bodie, G. S.	Cal		100,590
Bodie Tunnel, G.	"		51,447
*Bonanza King, G.	"	67,573	334,223
*Boston & Montana, G.	Mont.		72,318
*Central Arizona, S.	Ariz.		35,845
*Christy,	Utah.		117,736
*Chrysolite, S. L.	Colo.	$43,545	216,516
Cons. Bobtail	Colo.		18,723
*Contention, S.	Ariz.		475,824
Crescent, G.	Cal		13,000
*Custer, G. S.	Idaho		43,572
*Deadwood-Terra, G.	Dak		172,277
*Derbec Blue Gravel, G. S.	Cal		44,729
Evening Star, S. L	Colo		47,061
*Father de Smet, G.	Dak.		153,105
*Frisco M. and S. Co., G. S. L.	Utah		$77 084
Gunnell, S	Colo.		58,828
*Head Center Cons.	Ariz.		8,109
*Head Center and Tranquillity	Ariz.		42,601
*Hecla Cons., G. S.	Mont.		293,922
*Homestake, G.	Dak.		419,148
*Hope, S.	Mont.		41,963
Horn-Silver, S. L.	Utah		1,283,000
Idaho, G.	Cal		88,642
*Independence, G. S.	Nev.		32,991
Iron Silver. S. L.	Colo.		503,831
*Jocuistita, S.	Mex		‡228,022
*Kentuck, G. S.	Nev		10,393
*Lexington, S.	Mont.	107,655	638,488
*Little Pittsburg, S. L.	Colo.	7,451	35,645
*Marguerite, G.	Cal		33,200
*Martin White, G. S	Nev		136,317
Morning Star, S. D	Colo.		84,428
*Moulton, G. S.	Mont.		123,288
Mount Diablo	Nev		127,311
*Navajo, G. S.	"		243,962
*North Belle Isle	"		1,953
Northern Belle, S.	"		388,525
*Ontario, S. L.	Utah	87,652	1,038,687
*Oxford, G.	N. S.	7,076	35,255
*Phœnix, G	S. C.		†3,666
*Pinal Cons., S. L.	Ariz		163,400
*Satenio, G.	N. S.		2,500
*Silver Bow, G. S.	Mont.		101,241
Standard, G.	Cal		442,796
Star, S.	Nev.		27,095
*Stormont, S.	Utah		95,658
Syndicate, G.	Cal		20,073
Tintic M. and M. Co.	Utah		7,632
*Tip Top, S.	Ariz.		‡22,983
*Tombstone, G. S.	"	91,400	414,230
Wyoming Cons	Cal		31.541
Yellow Jacket, S.	Nev.		183,064
Total amount of shipments to date			$10,025,557

* Official. † Net value. ‡ Assay value. § Not including value of lead. *G. Gold S. Silver. L. Lead.*

METALS.

NEW YORK, Friday Evening, July 13.

Official returns place the German exports and imports of metals as follows, the metric ton being the unit:

	Imports.	Exports.
Sheet-lead	46	1,076
Pig-lead	1,972	41,916
Litharge	2,184	2,393
Rolled copper	159	1,409
Ingot copper	10,579	6,097
Copper wire	71	588
Brass	436	1,265
Nickel	173	55
Quicksilver	396	6
Pyrites	108,709	27,517
Sheet-zinc	148	14,270
Spelter	4,395	56,478
Zinc ores	24,567	8,846
Tin	5,636	667

Copper.—This metal is beginning to show elements of greater strength. The export engagements have been heavy, and we note that both Baltimore and Anchor brands are quoted in London, although the figures are still considerably below Best Selected, with which they rank in quality.

The latest reports from Arizona are by no means encouraging to the producers there. In the Globe District, only one company is running, and in Clifton the Scotch company seems to have got pretty deep into the mire, through the incapacity of the managers, who do not appear to be able to smelt the siliceous ores of the Metcalf group without the ferruginous ores of the Longfellow, from which they have been cut off by the cave in that mine. The Arizona product will, therefore, not be as heavy as has been anticipated, while the only metal that now reaches our market from Butte is that from the Parrott, the product of the other smelters being shipped abroad.

We note this week sales, at private terms, for home consumption, of between 700,000 and 800,000 pounds of Baltimore copper, and of about 200,000 pounds of Lake ingot and wire bars for export at 15½c. England cables Chili Bars to-day at £63 15s.@£64, showing firmness there.

Tin.—The market has been quiet. At the Exchange, there have been sales during the week of 250 tons, the latest to-day being 25 tons spot at 21c. We quote for jobbing lots, spot cash, 21¼@21⅜c. for Straits, 21¾c. for Lamb & Flag, 21½c. for Australian, and 22c. for Banca. London cables to-day, £92 10s.@£92 15s.

Lead.—Our market has been very dull, with only a few small sales, not aggregating more than 200 tons of Common at 4⅜c., and 4·35c., and it does not appear to be salable at the latter figure now.

Messrs. John Wahl & Co., of St. Louis, wire us as follows to-day:

Our market has declined slowly since our last report; there are more sellers than buyers, and hence prices are weak. Ordinary Missouri has been sold here to Eastern consumers at 4·10c., sales being 130 and 170 tons of Refined at 4·10½c.

Messrs. Everett & Post send us the following dispatch:

The market is very flat and weak, and buyers are holding off, taking only for immediate requirements, as they expect a decline. Offerings, however, are very light, especially of Refined. We note sales of 300 tons of Common at 4·15c., and 200 tons of Refined at the same figure.

Spelter.—The market is extremely dull, in spite of the fact that among all metals this ore is apparently most favorably situated. Good ordinary domestic brands are freely offered here at 4·50c. England cables £15@£15 2s. 6d.

Antimony.—Nothing has been done. We quote Cookson's nominally 10⅝@10⅝c., and Hallett's 9⅝@9⅝c. for large lines.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, July 13.

The total stock in bond at the ports of New York, Philadelphia, Boston, Baltimore, and New Orleans are, according to the same authority:

	Jan. 1. Tons.	June 1. Tons.	July 3. Tons.
Pig-iron	6,330	7,635	4,242
Spiegel iron	4,131	2,609	1,396
Old rails	5,504	2,665	2,711
Scrap iron	1,384	3,023	4,008
Scrap steel	456	306	560
New iron rails	6,842	4,119	255
New steel rails	4,816	4,587	.....
Grand total	29,263	24,944	13,172
Decrease during June, 1883			11,772

Official returns place the exports and imports of iron and steel of Germany as follows for the year 1882, the unit being the metric ton:

	Imports.	Exports.
Iron ore	785,359	1,621,182
Merchant iron	15,785	144,407
Wire	3,496	227,415
Pig-iron	283,009	186,938
Scrap	8,048	59,548
Plate and sheet	3,157	44,204

The following figures, showing the imports of iron and steel and the stock in bond at New York, have been compiled by Mr. Edward J. Shriver, Secretary of the New York Metal Exchange:

Articles.	Imports. May.	Imports. June.
	Tons.	Tons.
Pig-iron	10,797	12,206
Iron ore	2,157	1,509
Spiegel iron	3,981	5,704
Old rails	179	178
Scrap iron	1,308	1,839
Scrap steel	4,176	7,981
Steel blooms	209	372
New steel rails	10,928	3,572
New iron rails	.....	.....
Steel wire rods	9,952	13,963
Iron wire rods	393	600
Swedish iron	1,262	2,098
Iron bdls. and bars	78	100
Iron beams	236	401
Hoop-iron	115	2
Sheet-iron	279	453
Russia sheet-iron	.....	.....
Steel bdls., bars, etc	678	476
Steel tires and forgings	298	312
Iron tubes	.....	.....

Articles.	Stock in Bond. Jan. 1.	June 1.	July 3.
	Tons.	Tons.	Tons
Pig-iron	2,822	4,033	2,767
Iron ore	.....	.....	.....
Spiegel iron	2,705	1,699	539
Old rails	4,552	1,792	1,778
Scrap iron	694	2,487	2,849
Scrap steel	456	306	306
Steel blooms	.....	.....	.....
New steel rails	2,603	2,802	.....
New iron rails	5,638	3,020	.....
Steel wire rods	5,253	6,953	1,786
Iron wire rods	707	1,386	1,414
Swedish iron	1,566	1,626	1,627
Iron bdls. and bars	.....	.....	.....
Iron beams	.....	.....	.....
Hoop-iron	.....	.....	.....
Sheet-iron	85	101	101
	Lbs.	Lbs.	Lbs.
Russia sheet-iron	1,090,880	848,890	814,890
Steel bdls., bars, etc	.....	.....	.....
Steel tires and forgings	.....	.....	.....
Iron tubes	.....	.....	.....

American Pig.—The feeling continues to improve, although furnace agents do not report any heavy sales, and we are able to note this week that the improvement has spread from No. 1 to No. 2, which is now also attracting more attention. At the Metal Exchange, the following transactions have been reported: Monday, 200 tons No. 1, September, at $22.75; Tuesday, 400 tons No. 1, September, at $22.75, and 200 tons, October, at $22¼; Thursday, 500 tons No. 1, September, $22⅜, and 100 tons No. 1, October, $23; and to-day, 100 tons No. 1, November, $22⅜. We quote for spot, according to brand, $21.50@$23 for No. 1 Foundry, $19@$20 for No. 2, and for Gray Forge, $18.50@$20. Bessemer pig is quiet and unchanged, buyers' and sellers' views lying apart. England cables 50s.@51s. 3d. f. o. b. Spiegel is dull, with 20 per cent quoted at $31. There is little demand.

Scotch Pig.—The market is feeling the impetus of better figures for American Pig, a firmer market in Glasgow, and higher freights, which are cabled 7s. 6d. Sales during the week aggregate from 800 to 1000 tons in lots at the following quotations ex ship: Coltness, $23.75@$24; Langloan, $23.75@$24; Summerlee, $23@$23.50; Dalmellington, $21.25@$21.50; and Eglinton, $21@$21.50.

At the Exchange, the following cable quotations were received: Coltness, 59s. 3d.; Langloan, 60s.; Summerlee, 57s.; Gartsherrie, 57s. 9d.; Glengarnock, at Ardrossan, 54s. 6d.; and Eglinton, at Ardrossan, 48s. 6d. Warrants to-day were 47s.

Rails.—There is very little doing, although the inquiry for small parcels for early delivery is fair, $38@$39 at mill being quoted. There have been transactions for winter delivery, bids not being higher than $36.50, which the mills decline to accept.

Old Rails.—Trade continues very dull, with but few transactions to base quotations upon. We quote Ts $21@$22. We quote a sale of 600 tons of cropends at the Exchange for July delivery at $25 delivered.

Scrap.—There is very little business to report, quotations remaining nominally $21.50@$22.50 ex ship for No. 1.

Philadelphia. July 12.

The past five days have developed very little of special interest, outside of crude iron. The trade is in an attitude of expectation on both sides. Neither manufacturers nor consumers are willing to make a

NEW YORK MINING STOCKS.

DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	HIGHEST AND LOWEST PRICES PER SHARE AT WHICH SALES WERE MADE.												SALES.
	July 7.		July 9.		July 10.		July 11.		July 12.		July 13.		
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Alice, Mon.													
Anaie Con., Co.	.16		.17	.16	.15		.15	.14	.14		.15	.14	10,400
Argenta, Ne.	.15												200
Bar. & Walker, Ut.													
Bassick, Co.			10.38				10.25		10.25				325
Belle Isle, Ne.	.47		.43								.46	.45	700
Bodie Cons., Ca.	.90				.75				.75				220
Breece, Co.													
Bulwer, Ca.	1.00	.90											645
California, Ne.	.15	.12			.13	.11	.13		.15		.12		5,430
Cal. & Hecla, Mich.													
Carbonate Hill													
Caribou Con., Co.	.13								.14	.13	.13		1,700
Chrysolite, Co.	1.25	1.20	1.25		1.30	1.25	1.25		1.15		1.20		4,700
Climax, Co.	.17	.15	.16	.09	.14	.10	.12	.10	.13				11,400
Cons. Va., Ne.	.45				.47		.43				.45	.40	4,100
Crown Point													
Deadwood-Terra, Dk.													
Dunkin, Co.													
Eureka Cons., Ne.	6.50		5.38		6.10	5.83	4.50						600
Excelsior, Ca.													
Father de Smet, Dk.													
Findley, Ga.													
Gold Stripe, Ca.													
Gould & Curry, Ne.			2.35		3.70								200
Grand Prize, Ne.			.09								.35	.10	2,200
Great Eastern, Dk.													
Green Mountain, Ca.	.71												700
Hale & Norcross, Ne.													
Hall-Anderson, N. S.													
Hibernia, Co.											.09		100
Homestake, Dk.			10.00										50
Horn-Silver, Ut.	7.50	7.00	7.50	7.00	7.75		7.25	7.00	7.37		7.00		1,455
Hukill, Co													
Independence, Ne.													
Iron Silver, Co.					3.10	2.95			3.00	2.95	3.90		1,520
La Plata, Co.													
Leadville C., Co.	.55										.54		400
Little Chief, Co.			.55	.53	.54								2,000
Little Pittsburg, Co.			.80								.70	.66	400
Martin White, Ne.													
Moose, Co.													
Navajo, Ne.			2.25		2.90	2.55	3.00		2.90	2.80	3.00	2.95	3,900
Northern Belle, Ne.	6.87		7.00		6.75	6.50	6.65	7.00	6.63				1,210
North Belle Isle, Ne.													
Ontario, Ut.													
Opair, Ne.													
Plumas, Ca.													
Prussian, Colo.													
Quicksilver Pref., Ca.													
" Com., Ca.													
Rising Sun, Ca.													
Robinson Cons., Co.	.55		.55	.54	.70		.58		.60	.54	.59		2,550
Saint Joseph's Lead.									7.00				1,000
Savage, Ne.													
Sierra Grande, N. M.			1.25	1.10			1.20	1.15					1,900
Sierra Nevada, Ne.	3.40				4.50		4.10				4.35		675
Silver King, Ar.	10.12	10.00					9.00						450
Spring Valley, Ca.													
Standard, Ca.	7.25				7.50	7.12	6.87		7.25				580
Stormont, Ut.	.48								.48	.46	.48	.47	4,000
Tip Top, Ar.													
Tombstone, Ar.													
Vizina, Ar.													
Yellow Jacket													

NON-DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	HIGHEST AND LOWEST PRICES PER SHARE AT WHICH SALES WERE MADE.												SALES.
	July 7.		July 9.		July 10.		July 11.		July 12.		July 13.		
	H	L.	H	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Advance.	.50												1,100
Albion.													
Alta.													
Alta-Montana, G.					.02		.02	.01	.02				3,100
Am. Flag, s.													
Barcelona, G.													
Bear Creek													
Bechtel Con., G.													
Belvidere													
Best & B'icher, G. s.													
Big Pittsburg, s. l.													
Bradshaw, s.	.28												1,000
Buckeye													
" pref.													
Bull-Domingo, s.l.													
Bye and Bye.													
Calaveras, G													
C'lav'r's W.&M.Co.													
Cal., B. H., G.					1.00				1.00				400
Central Ariz'na, s.							.80				.30		400
Cherokee, G.			.03										1,000
Climax, Co.													
Cons. Imp'ri'l, G.s.													
Crowell, G.													
Dahlonega, G.											.04	.03	1,800
Decatur													
Dunderberg													
Durango, G.							.05						500
Eastern Oregon	.65		.67	.65	.70	.68	.71	.70	.72	.70	.72		12,800
Elko Cons.			.25	.23	.25	.23	.23				.19		2,100
Enterprise													
Fannie Barret													
Globe Copper													
Gold Placer, G													
Goodshaw, G.													
Granville, G.													
Harlem M.& M.Co.													
Hortense, s.													
Imperial.	.04												200
Lacrosse, G.			.10										700
Lucerne													
Mariposa Pref., G.													
" Com., G.													
Mexican, G. s.													
Miner Boy													
Mono.													
North Standard, G.													
N. Horn-Silv'r, s.l.													
Ori'nt'l & Miller, s.			.13										700
Parnell.			.44	.43							.42		1,000
Quartz Creek.													
Rappahannock, G.	.08												1,500
Red Elephant, s.					.07							.06	3,100
Ruby, of Arizona.													
Silver Cliff, s.													
Sonora Con.	.21	.18	.38	.20	.40	.32	.31	.24	.25	.21	.26	.22	100 800
South Bodie, G.													
South Bulwer, G.													
South Hite.													
South Pacific.													
State Line, 1 & 4, s.													
" Nos. 2 & 3, s.											.03		300
Sutro Tunnel.	.22	.20	.21		.22	.21	.21	.20	.21		.21		12,100
Taylor Plumas													
Union Cons., G. s.	4.75				5.25		5.00		5.50		5.25		970

Full tables giving the total amount of dividends, capital, etc., will be printed the first week of each month. Dividend shares sold, 67,710. Non-dividend shares sold, 156,300.

BOSTON MINING STOCKS.

	July 6.		July 7.		July 9.		July 10.		July 11.		July 12.*		Sales.
	H.	L.	H	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Allouez.													
Amie.													
Atlantic													
Aztec.													
Bodie Con.													
Bonanza D.			2.25				2.37½		2.25				300
Bowman Sil	.31	.27	.33	.28	.31	.30	.30	.29	.33	.28			16,800
Bruns. Ant.													
Bulwer.					.25								100
California.													
Cal. & Hec.	242		242		242								10
Catalpa.	.55				.55								200
Central Ariz													
Climax													
Co. Virginia	.45				.45								400
Copper F'lls													
Copperop.													
Crescent.									.22½				200
"Cusi"					.65	1.62½							100
Decatur													
Deer Isle.													
Denver City													
Douglas.			1.00		1.00								200
Duncan.													
Dunkin.													
Empire			.25		.26		.26		.25				1,500
Eureka Con.									6.00				50
Franklin.	10.00						10.00						95
Hancock G.													
Harshaw.	.50								.50				325
Huron.	1.63				1.63								400
Independ'ce													
Indian Q'n.													
Mammoth													
Mass. & N.M.	.09	.08					.09	.08	.09	.08			20,000
Milton.													
Napa.													
National.													
North. Belle													
Ontario													
Osceola.	20.00	19.50	19.50						19.50				25
Penn-Breck.													
Pewabic													
Pine Tree													
Plymouth													
Quincy.			50.50	50 00	51.50	50.00							256
Ridge.													
Robinson.							.55						1 0
San Pedro.													
S'ra Nevada	4.00												100
S'ra Grande													
Silver Islet.	4.00												2
Silver King.					10.25								50
Simpson Gd													
So. Pacific.													
Standard.									7.50				20
Sullivan.	1.25				1.18¾		1.25	1.12½	1.06¾				700
Sutro Tun.	.21				.22				.21				900
Sycamore.	.50												200
Twin Lead.	.13	.12	.15	.12	.15	.14	.15		.15	.14			15,780
Vizina													

PHILADELPHIA MINING STOCKS.

	July 6.		July 7.		July 9.		July 10.		July 11.		July 12		Sales.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Amer. Cons.													
Argent.	.23	.22	.23	.21	.23	.21	.22	.19	.22	.18	.20	.19	27,600
Arizona So.													
Battle Mt.					.04	.03							2,000
Buena.													
California.													
Calista.													
Chrysolite													
Cincinnati.					.11				.11	.10	.11		9,800
Comprom'e.	.20								.22	.19			4,900
Contention.													
Con. Virg.													
Dauntless.													
Del Monte.											.03		1,000
Denver City	.18	.16	.16								.17		2,900
Eureka.													
Girard.	.06	.05	.05		.06	.05							3,400
Governor.													
Grand Uni'n	.18				.18	.17	.18		.19	.18	.19	.18	9,500
Green Mt'n													
Gunnison.	.45	.42½	.42½	.45	.40								4,200
Homestake.													
Horn Silver.													
Iowa Gulch.	.22	.11	.12	.10	.11	.10	.11	.10	.10	.07	.08	.07	10,200
Iron Silver.													
King Bul'on													
Ledger Con.													
Little Dia'd.													
Little Maud									.05				1,500
Little Pitts.													
L'g & D'y H													
Montana													
Mt. Sheridan	.04								.04				2,000
Navajo.													
North'n B'l.													
Orion.													
Orion Pref.													
Palmetto E.													
Pembina.	.15		.16		.16		.16						2,700
Penn-Breck.	.10		.11	.10	.10	.09	.10	.08			.10		18,100
Permanent.	.02				.02								9,000
Pizarro.													
Pizarro Ex.			.01										8,000
Potosi.													
Rara Avis.			.27½	.25		.30							700
Rara Avis E.	.09		.09		.09		.09		.13		.09		8,000
Record													
Rico Pion'r.													
Sierra Apac.							.25		.25				1,700
Sierra Be la.	.57½	.55			.60	.57½	.60	.57½					13,900
Sierra G'nde	1.20	1.07½	1.22½	1.12½	1.15	1.12½	1.17½	1.10	1.17½	1.05	1.22½	1.15	21,300
Sierra Nev.													
Silver Cord.			1.60				1.60				1.62½		2,700
Silver King.													
Silv'r Plume	.02		.02				.02		.01				51,300
Sonora Con.													
Standard.													
Sultana.	.04		.04				.04						5,000
Sutro Tun'l.													
Tombstone.			1.00				1.00				1.00		2,100
Victor.			.02		.02		.02				.02		25,000
Yale Mt.													

*Reports for July 12th were not received.

move while they regard the market as liable to sudden change. Pig-iron is unexpectedly strong, especially in the higher grades. Offers were made to-day for some of the special brands at $23.50, and they can not be had. Regular buyers are favored, and hence outsiders find stocks sold ahead, frequently at 50 cents less than market rates. Standard makes run from $22@$23, and in some cases future delivery can not be had, even at these figures.

Outside of half a dozen brands, there is no difficulty in buying iron at reasonable rates. Nothing in good No. 1 has been heard of under $22. More or less No. 2 is offered and sold as No. 1, owing to the scarcity. No. 2 ranges from $20@$22, and some little is selling at the latter quotations, though well-known makes are going at $20, and sales have been heard of at $19.50.

Gray Forge iron continues dull. Some inquiry has been developed, but transactions are of rare occurrence. Quotations range from $17@$19. A few transactions of a few hundred tons each were close in the neighborhood of $18 at furnace. Some makes are held firmly at $18.50, and the very best makes are sold up. Some inquiry is coming for Bessemer pig, but buyers will not purchase, except at figures which makers can not accept.

In Muck Bars, an improving feeling has shown itself for the best makes, and sales are known of at $35. A few hundred tons of Charcoal Blooms sold at $60@$61, while poorer makes sold as low as $56.

Anthracite are $47@$49, and Scrap Blooms, $44.

Merchant Iron.—The closing down of a good many mills and the uncertainty as to how long they may be out has given the retail trade in Merchant Bar a little more firmness and activity. Brokers are receiving orders at 2·20c., and stores are doing business at 2·25c., and in some cases at 2·30c. in small lots. Buyers are not making any particular move as yet, knowing that the output will prevent any upward tendency and that Western iron can be relied upon in any event. Several inquiries are in hand, but buyers are not ready to close. They are feeling around with a view to future purchases.

There is less activity in nails, and selling prices are unchanged. The action of the Western nail men will help this market. Car-load lots are sold at $3, and there is very little disposition to cut prices. Stocks are not large enough to create very active competition.

Structural Shapes.—Within a day or two, some inquiries have come to hand for structural iron, which manufacturers expect to have orders for in a week or ten days. Quotations are 2·40c. for Angles, 3·20c. for Tees, and 3·50c. for Beams and Channels. It is said that some large contracts will be given out during this and next month for bridge work.

Plate and Tank Iron.—The low prices in plate iron have brought out a good many orders within a few days, and five or six of the larger mills here are now crowded. Negotiations which had been pending for a long time were suddenly closed. Very few mills are short of orders, and at present figures there will be no difficulty in keeping busy.

Sheet-Iron.—More business was received this week at 4@4½c. Galvanized is specially active. A large amount of building will be begun immediately, as is indicated by the number of permits taken out for work to be finished before winter.

Wrought Pipes and Tubes.—Steam Pipes can be bought at 72½ off list, and Tubes at 60 per cent off. Low prices have brought out buyers, and the week's business has been large.

Steel Rails.—Most of the business transacted this week in Steel Rails was in small lots at $39@$40.

Old Material.—Old material is without any activity whatever, and rails are nominally $21.50 for Tees.

Scrap.—Yard-men have managed to dispose of a few hundred tons of Cast No. 2 and No. 1 at prices ranging from $17@$24.

Pittsburg. July 11.

No improvement has been developed during the past ten days. Pig-iron has gone so low that furnacemen are not desirous of taking large contracts at present figures, as cost is barely obtained. Stocks are accumulating in the Mahoning and Shenango valleys. Supplies at Wheeling are large, and, in Alleghany County, stocks of iron are accumulating in consequence of the shutting-down of mills for repairs. Buyers are without stocks, and will not anticipate requirements until after the resumption, which will take place about August 1st.

The demand for unfinished iron is dull, and prices range from 1·80@2c. A few mills in this district are still running. The demand for nails has temporarily fallen off, and prices are $2.90.

The action of the nail manufacturers was a foregone conclusion, and will lead to an improvement in prices for the fall trade.

A good inquiry has developed for sheet-iron and wrought-iron pipe.

Building activity will absorb the bulk of the production of the mills furnishing construction iron.

Steel rails are quoted at $38@$40, and small orders are placed at the latter figure.

Old rails are quoted at $22.50, and negotiations will be closed for summer shipments abroad at that figure.

Spikes are 2·60c. Crop-ends, $25. No. 1 Scrap, $24.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, July 13.

Anthracite.

Current business is quiet, middlemen being fully occupied in placing the coal taken by them, while buyers are as a rule content to await developments. The local retail trade has not as yet shown any disposition to take more than is necessary to meet the small current demand. The opinion seems to prevail that a very quiet month will follow the June maneuver, though it is likely that it will prove of considerable interest in other ways. Full-time work is to begin next week, and the leading companies will strain every nerve to put a heavy quantity of coal Westward. How soon friction will be developed by the efforts of the new-comers, remains to be seen. A few specks are making their appearance on the horizon even now. So long as peace reigns in the West, our markets will to some extent be benefited, as the pressure to sell will be less. Should the struggle there, which is looked upon by many to be inevitable, cease to be local and begin in general, then there may be some irregularities here.

From Philadelphia come reports of scarcity, which, however, are not likely to be more than temporary.

The report circulated in the anthracite region that the Philadelphia & Reading Coal and Iron Company will work the mines of the Lehigh & Wilkes-Barre, as early as August 1st, is not confirmed here. That this will be done in the near future is beyond doubt, but it is not believed that the matter will be consummated before the first of September.

Advices from the East are not rose-colored, and the general business situation has not as yet shown any signs of improvement, which, however, is not looked forward to until the close of the month or the middle of August.

Bituminous.

The only transaction of interest worthy of being recorded this week is the sale of 10,000 tons of Cumberland coal to the Fitchburg Railroad at $2.85 at Georgetown, which would be equivalent to about $4.35 delivered in Boston. Business is quiet and dull, with a slight undercurrent of strength. Consumers recognize that prices for bituminous coal are very low. There are many evidences that, for steam-making purposes, bituminous coal on the seaboard is gaining ground considerably. We quote Clearfield coal $3.75@$4.10, and Cumberland $4.10@$4.40, according to quality. Freights are declining, a fact which is favorable to all the shippers who have heavy contract engagements, but is not of any great influence upon current business.

STATISTICS OF COAL PRODUCTION.

Belvidere-Delaware Railroad Report for the week ended July 7th:

	Week.	Year. 1883.	Year. 1882.
Coal for shipment at Coal Port (Trenton)	717	46,650	34,254
Coal for shipment at South Amboy	4,451	405,430	410,056
Coal for distribution	8,173	393,908	360,499
Coal for company's use	1,501	74,494	65,566
Total	14,842	920,482	871,375
Increase		49,107	
Decrease			

Comparative statement of the production of anthracite coal for the week ended July 7th, and year from January 1st:

TONS OF 2240 LBS.	1883. Week.	1883. Year.	1882. Week.	1882. Year
Wyoming Region.				
D. & H. Canal Co.	21,800	1,790,355	63,132	1,602,252
D. L. & W. RR. Co.	45,228	2,204,252	79,323	2,094,244
Penna. Coal Co.	13,771	637,692	31,887	613,092
L. V. RR. Co.	5,310	525,965	16,198	528,198
P. & N. Y. RR. Co.	2,626	100,018	3,546	98,730
C. RR. of N. J.	23,976	1,202,078	31,461	1,124,506
Penna. Canal Co.	5,105	165,737	10,471	163,758
North & West Br. RR.	8,350	230,254	.....	.....
	126,166	6,916,351	236,018	6,244,780
Lehigh Region.				
L. V. RR. Co.	49,540	2,333,044	76,853	2,248,175
C. RR. of N. J.	21,206	1,126,889	43,234	1,039,799
S. H. & W. B. RR.	1,674	27,095	.....	20,000
	72,420	3,487,028	120,087	3,307,974
Schuylkill Region.				
P. & R. RR. Co.	58,710	3,292,164	114,989	3,037,557
Shamokin & Lykens Val.	15,881	674,979	19,628	565,645
	74,591	3,967,143	134,617	3,603,202
Sullivan Region.				
St Line&Sul.RR.Co.	1,173	31,100	712	27,782
Total	274,350	14,401,622	491,434	13,183,738
Increase		1,217,884		
Decrease	217,084			

The above table does not include the amount of coal consumed and sold at the mines, which is about six per cent of the whole production.

Total same time in 1878 ..... 7,510,905 tons.
" " " " 1879 ..... 12,562,206 "
" " " " 1880 ..... 12,932,194 "
" " " " 1881 ..... 12,932,194 "

The increase in shipments of Cumberland Coal over the Cumberland Branch and Cumberland & Pennsylvania railroads amounts to 389,027 tons, as compared with the corresponding period in 1882.

The Transportation of Coke over the Pennsylvania Railroad for the week ended July 7th, and year from January 1st:

Tons of 2000 lbs.	Week.	Year.
Penn. RR. (Alleghany Region)	450	50,353
West Penn. RR	1,525	54,608
Southwest Penn. RR	34,026	1,045,820
Penn. & Westmoreland Region, Pa. RR	3,001	117,196
Pittsburg, Penn. RR	15	469
Snow Shoe (Clearfield Region)	396	10,758
Total	39,413	1,279,204

Horsford's Acid Phosphate
In Seasickness.

S. S PARKER, Wellington, O., says: "While crossing Lake Erie, I gave it to some passengers who were seasick, and it gave immediate relief."

FOR SALE.

ENTIRE PROPERTY OF

The Farwell Con. Mining Co.,

Situated in Independence Gulch, Pitkin County, Colorado, consisting of

Extensive Gold Mines, developed,

Large tract of

Placer Claims, undeveloped,

One 30 and One 20-Stamp Mill,

Nearly new, in Complete Running Order, with Steam and Water Power.

Tunnel and Mill-Sites, with Water-Rights, Ditches, Pipes, etc.,

And all improvements. Greater part of property with patent title. No application to lease need be made. For further information address

W. B. DICKERMAN,
74 Broadway, New York City.
WILLIAM H. PHILIPS,
214 West 19th street, New York City.
ROBERT E. BOCRAEM,
Leadville, Colorado.

DIVIDENDS.

OFFICE OF QUINCY MINING COMPANY.

NEW YORK, July 11, 1883.

DIVIDEND NO. 30.

THREE DOLLARS AND FIFTY CENTS ($3.50) per share will be payable August 15th next, to holders of record 24th inst. Massachusetts holders will be paid at the office of Mr. N. H. Daniels, 2 Change Avenue, Boston. By order of WILLIAM ROGERS TODD, Treasurer.

OFFICE OF THE HOMESTAKE MINING COMPANY, MILLS BUILDING, 15 BROAD STREET, NEW YORK, July 13, 1883.

DIVIDEND NO. 59.

The regular monthly dividend of FORTY CENTS per share has been declared for June, payable at the office of the Transfer-Agents, Lounsbery & Haggin, Mills Building, 15 Broad street, on the 25th inst.

Transfer-books close on the 20th inst.

LOUNSBERY & HAGGIN, Transfer-Agents.